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JEAN MICHEL JARRE

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CLASS OF '88

WHAT VALUE EDUCATION? Musical education, that is. We frequently read Music Technology interviews with musicians who extol the virtues of a musical education - and as frequently we read interviews in which the featured musician credits his creativity to his musical ignorance. And the controversy doesn't stop there: elsewhere in this issue you'll find a reader's letter discussing this very issue.

What will a "classical" musical education give you? Well, hopefully, it'll allow you to cope with that dreaded musical phenomena: the dots (almost essential to a successful session player); it'll give you an insight into the "traditional" considerations of composition; an understanding of melody; harmonic, melodic and rhythmic counterpoint. It may even teach you to play. Sounds like a good deal.

And no musical education leaves you in the mire, right? Obviously not, as many successful modern artists are untaught or self-taught. Many flout the "rules" of composition, arrangement, harmony and so on, and yet the music works. More than that, it often works well and sells well. Equally there's a lot of dross in contemporary music and it's tempting (often irresistible) to certain advocates of traditional music tuition) to blame this on musical illiteracy.

As I write, there are moves afoot to improve the standards of musical education with academia - the Performing Right Society has just launched a *Composers in Education* scheme designed to pay for professional composers' time spent on special projects within state schools. As a matter of fact they're accepting proposals for such projects right now.

Another familiar claim is that technology is "setting the musician free". Free from their inadequate playing ability. Free from their inability to sight read. Free from the dependence on other musicians . . . But as often as not, these

"new freedoms" are remarkably similar to those found by our musical predecessors in their encounters with music technology - see the 1903 newspaper extract in last month's editorial.

AS FAR AS I can see, an awful lot of inventive musical ideas have been born as a direct result of people's inability to play that which "the system" would have encouraged them to. And the only irony in this situation is that much of this originality is lost simply because it doesn't fit in with traditional methods of notation and performance. Nor does this appear to be a peculiarly '70s or '80s phenomenon - it's been called folk music of one sort or another for centuries. What often happens with folk music is that it surfaces in a "respectable" composer's work at a later date - and he or she takes all the credit (Tchaikovsky and Borodin to name but two; at least Vaughan Williams acknowledged his sources).

On the subject of technology, there does seem to be one genuine revolution taking place, and it has to do with circumventing traditional musical education. For the first time in history an "uneducated" musician is able to conceive, arrange and perform music that is too complicated for one person to play without the assistance of other musicians. In the past, anyone with a musical imagination but without any musical education effectively has been prevented from doing this by their inability to communicate with other musicians through the staff. Now anyone can compose and play music of almost any degree of complexity without understanding the principles of melody and harmony - without being able to play. In fact, they can even produce a score without being able to read a single note or rest of it themselves. Now, isn't that progress? ■ Tg

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DBX SNR1 Stereo Noise Reducer	£279
ART Multiverb Multiple Effects Unit inc 4 at 1 time	£399
ART Proverb 200, Remarkable New Reverb/Multi-Effects Unit	£299
ART Proverb, One Only	£250
ROLAND SRV2000 Digital Reverb	£653
ROLAND DEP3	£345
YAMAHA GQ2031 Graphic	£375
YAMAHA GQ1031 Graphic	£215
YAMAHA GC2020B Comp/Limiter	£285
VESTA FIRE Rack includes two parametric and one compressor cw	£125
PSU	£33
JACK 32 way patchbay	£29
DI Boxes, from	£POA
TC Electronics 2290 The Ultimate Delay Sampler	£POA
TC Electronics 1128 The Ultimate Graphic EQ with SMPTE	£POA

MONITORS

Electrovoice Sentry 100A	£729
Electrovoice Cristal	£279
JBL 4401	£299
JBL 4411, ex-demo	£999
Yamaha NX10M	£265
Yamaha NS40M	£690
Visonik David 6001, S/H	£85
JBL Control 1	£130
Fostex 6301B	£125

SEQUENCERS

ALESIS MMT8	£289
NEW YAMAHA QX21, One only, ex-demo	£159
NEW YAMAHA QX3 16 Tracks	£999
ONE ONLY SHOP STOCK YAMAHA QX3	£925
NEW ROLAND PR100	£350
KORG SOD1, Used, inc 10 Quick Disks	£295
Ex-Hire YAMAHA QX1, one only	£899
Ex-Demo MC500, Mint Condition/Manuals	£550
THIS MONTHS SUPER DEAL!! ALESIS Midverb II Multi-Effects Unit	was £449 Now £199

SYNTHESISERS

ROLAND D50, New, In Stock	£Phone
ROLAND JX10, ex-demo	£1,299
ENSONIQ ESQ1 inc Flightcase	£995
ENSONIQ SO80	£1,395
YAMAHA DX21, Used, Boxed	£399
YAMAHA DX27S, Built-in Speakers	£475
YAMAHA DX11, NEW Great Sounds	£599
YAMAHA PF85 Sampled Piano, one only	£999
YAMAHA CP80 Electric Grand, ex-hire	£1,599
YAMAHA DX7s	£875
YAMAHA DX711D, New In Stock	£POA
YAMAHA DX711FD Disk Drive	£POA
KORG DV8000, ex-demo	£899
Used Bit One	£375
Used KORG Polysix	£350

POWER AMPS

YAMAHA P2040, 4-way amp, you must have one	£279
YAMAHA P2075	£289
YAMAHA P2250	£489
YAMAHA PD2200	£799
SUPER DEAL OF THE MONTH! YAMAHA DX7s Supersynth with Alesis Midverb II, Both Boxed and Fully Guaranteed	£999

MIXERS

SOUNDTRACS PC16 MIDI Mixer	£3,250
SOUNDTRACS T SERIES	£1,899
ARIES 16:8:2, ex-demo	£1,399
SECK 8:2, New, New Low Price	£Phone
SECK 12:2, New, New Low Price	£Phone
SECK 12:8:2, New, Low Price	£Phone
YAMAHA DMP7, Second User	£2,099
YAMAHA DMP7, ex-demo	£2,599
TASCAM M106, New	£349
YAMAHA KM802	£245
YAMAHA MV802	£329
TASCAM 216 16:4:2	£849
TASCAM 308 8:4:2	£1,099
AKAI MPX820 Programmable MIDI Mixer B/2, Call For Demo	£899
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Used Studiomaster 12:2 (Flight case)	£499

ACCESSORIES

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Comment

2

Is music education a good thing? Does it contribute to the general quality of music and if so, is enough being done to promote it? Tim Goodyer delivers the lecture.

Newsdesk

7

Have you heard the news? The Music Technology newsdesk keeps bringing you up-to-date with current musical events and technological developments.

Interface

10

You have the questions, we have the answers - Casio FZI sample disks, Atari vs Amiga, the latest news on Ultravox - all in MT's exclusive advice column.

Communique

14

In this month's postbag there are letters about musical literacy, musical ability, musical creativity, musical integrity . . . And a fax for the Assistant Editor.

Free Ads

93

. . . the fish is in the garden . . . Michael won't play with Annie tonight . . . the wolf is on the loose . . . the bargains are in the free ads . . .

APPRAISAL

Yamaha G10

16

Is the practical MIDI guitar finally with us? Bob O'Donnell checks out the latest, and most promising, MIDI guitar controller from Yamaha.

Ensoniq EPS

18

It's nearly three years since Ensoniq struck it rich with the Mirage sampler. Simon Trask previews Ensoniq's new sampler and asks "can they repeat their success with the EPS?"

E-mu Emulator III

32

The latest version of E-mu's popular Emulator sampler incorporates stereo 16-bit sampling and a hard disk drive. Chris Meyer can't believe his ears.

Oberheim Matrix 1000

57

The latest addition to Oberheim's classic Matrix range offers 1000 analogue-style synth sounds for under £500. Simon Trask investigates the attraction of analogue in '88.



Roland S330

64

An inquisitive Gordon Reid poses the question "how much sampler can you get into a single rack space?". Roland's S330 sampling module replies "more than you might expect".

Steinberg's The Ear

72

Can you tell a minor third from a major seventh, or an augmented triad from a diminished triad? - Steinberg have a program to teach you how. Simon Trask lends an ear to a program with a difference.

Kurzweil HXI000/SXI000

76

For those without the time or the inclination to sample come two expanders dedicated to sampled horns and strings. Simon Trask finds out if Kurzweil's dedication has paid dividends.

EVENTS

10 AUGUST 1988



Dr T's MPE

Dr T's Multi Program Environment allows their KCS sequencer, Programmable Variations Generator and Copyist scorewriter to be used as part of an integrated system. Lorenz Rychner goes soft.

MUSIC

Jean Michel Jarre

Jean Michel Jarre is about to stage the world's biggest ever concert in the London Docklands. David Bradwell finds out about the technological dark age and the art of showmanship.

OutTakes

Techno! Baby Ford, NoWaMoWa, Violent on Vodka, S-Express . . . Records, concerts and readers' demos assessed by Music Technology's panel of music critics.

Ellis, Beggs & Howard

Recently seen effortlessly blowing Bo Diddley and Ron Wood off stage, Ellis Beggs and Howard have been compared to the Rolling Stones in musical significance. Tim Goodyer rediscovers rock 'n' roll.

Act

Whatever happened to Thomas Leer? What's become of Propaganda? If you've heard of a band called Act you already know the answers to these questions, if not, David Bradwell is right on cue with this interview.

STUDIO

APRS Report

The latest developments in the recording world brought the industry, press and public flocking to Olympia 2 recently. Simon Trask records the event.

Digitally Yours . . .

We've been sold and resold the idea that digital is better than analogue, but what is digital sound and why is it revolutionising music technology? Peter Bergen counts the bits.

TECHNOLOGY

DIY Single

If the major record companies won't give you the deal you know you deserve, you could do worse than to do it yourself. David Bradwell investigates the pros and cons of pressing your own single.

Exclusive Information

System Exclusive messages promised to make MIDI a flexible and powerful communications standard; instead it seems to have caused MIDI havoc. Vic Lennard takes an Exclusive look.

Patchwork

MT's Programmers' Forum. Readers share their own patches for the ever-popular Ensoniq ESQ1 and Casio CZ1000.

Vocal Coding

If you thought vocoders were just an obsolete way of making a singer into a Dalek, you've been missing out. Tom McLaughlin explains music technology's most overlooked innovation.



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ART AND TECHNOLOGY

GET YOUR HANDS ON

Tower Hamlets Youth Music Workshop, the Steamrooms Studio, will be running a 5-day multitrack recording course in September, which will give hands-on experience to musicians who want to learn about recording, or non-musicians who would like to learn to be sound engineers.

"Hands-On" is an intensive recording course covering the many aspects of sound engineering, including acoustics theory, recording, mixing, editing, mic techniques, learning to use effects, studio design and producing music. The emphasis will be firmly on a practical, hands-on gear approach.

The Steamrooms is an Andy Munro-designed 16-track facility, located on the top floor of Poplar baths, E14. It consists of a centrally-located control room with two music rooms to either side. The control room is equipped with a Tascam 16-track tape machine, Soundcraft 24:16 mixing desk, Auratone 5C and the ubiquitous Tannoy Little Red monitors, as well as a resident and well-qualified sound engineer.

NEWSDESK

Jon Wilkinson, who will be running the course, has 15 years experience as a sound engineer in the industry, with credits ranging from The Thompson Twins, Man Jumping, Alan Skidmore and Ronnie Scott to dance companies, radio jingles, film music and extensive experience in training and teaching people. Sounds like you'll be in capable hands if you decide to take up the offer.

The five-day course costs £250, and places are very limited, so get your skates on if you want to book.

More from Tower Hamlets Youth Music Workshop, Poplar Baths, East India Dock Road, E14. Tel: Brian Innis or Jon Wilkinson on 01-987 2738. ■ Dp

TEENY TRAINING

If you've come early to this life of woe, deprivation, corruption and confusion which is better known as being a musician, The Royal College of Music's junior department would like to hear from you.

It seems the RCM is where a teenager could go to learn jazz, MIDI guitar, Avant-Garde studio electronics or Baroque music and still play in a symphony orchestra. As well as the traditional forms of classical music tuition, there are two performance/study groups for jazz, led by Loose Tubes arranger and trumpet player, Dave DeFries. In the pop music field, producer Mike Steer

runs a Pop Studio workshop for would-be songwriters, and a more historically-based Popular Music Studies course.

But the most experimental aspect of the RCM Junior Division's new program is the Junior Electronic Music Studio Project, a recording course based in the RCM's 16-track digitally equipped studio, where Mike Steer and Javier Alvarez provide students with a thorough introduction to both conventional and avant-garde studio practice.

Gear in the studio includes two Atari ST's, samplers, synths and the Roland GM70 MIDI guitar, the use of which is taught by leading expert Steve Smith.

The preferred age range for the RCM Junior Division is 12-18 (although in the case of the MIDI guitar the college is willing to take individual students of any age to study this one instrument), and you'll have to audition before acceptance to make sure you can cut the mustard. You'll also have to be willing to give up part of some of your weekends, as the course takes place over ten Saturdays during each term.

More details are available from Christine O'Neal on 01-589 3643. ■ Dp

PULL THE OTHER ONE

Just when you thought it was safe to read Newsdesk... MT, once more in the forefront of modern technological developments, assaults you with news of a new and exclusive range of... knobs.

Major knob manufacturers Re-an have announced the first really new development in control knobs for years (not a moment too soon, I'd say). And if you find you don't need knobs for your years, take a look at the comprehensive range of Re-an collet and slider knobs which feature, for the first time, the latest in computer-controlled two-colour manufacturing technology.



Indicator lines are actually moulded into the body of your chosen component, which confers a variety of useful benefits; your knobs keep their looks as lines cannot get scratched off them, they won't wear out (unlike some older knobs I could think of), you will have a full choice of colours, and since the control is totally machine-made, the cost and quality problems of the old manually printed style of knob are eliminated.

Five different textured bodies, and a range of nine colours are offered in popular sizes, and in various spindle fits. Each option features a full-length indicator line in the colour of your choice.

The knob advances. The mind boggles.

More from Re-an Products Ltd, Springhead Enterprise Park, Northfleet, Kent. Tel: (0474) 328807. ■ Dp

LEXICON OF LUST

Even these days, the famed Lexicon digital reverb is still out of the reach of many a humble musician, but the release of the new budget LXPI reverb from Lexicon could mean you'll at least get the name in your setup.

As well as the name, though, the LXPI looks as though it might well have something to offer, with 16 basic MUSIC TECHNOLOGY AUGUST 1988

programs (not quite Midiverb II choice here), selectable pre-delay and decay time parameters, and a further six parameters available with the optional Lexicon MRC MIDI remote controller, which uses a MIDI bus to allow the operation of up to four LXPI reverbs.

Let's watch 'em battle it out.

More from Stirling Audio Systems Ltd, Kimberley Road, London NW8. Tel: 01-624 6000. ■ Dp

BITE THE APPLE

The Synthesizer Company are opening a complete demonstration showroom at their Hatton Street offices in London NW8, of all the latest Apple Mac products geared to the professional recording and audio visual industry.

The showroom is complete with

networked Mac II's, large Radius screen monitors, and professional MIDI interfaces from Passport, Opcode and Southworth, as well as software from Passport, Blank, Mark of the Unicorn, Southworth, Opcode and Dr T's.

For more information, contact Steve Rubra or Jonathan Cole on 01-258 3454. Or write to The Synthesizer Company at 9 Hatton Street, London NW8. ■ Dp

BOOK HIM DANNO: KEYFAX 3

Next to your prized back issues of MT, crammed with fascinating and informative reviews of the latest and greatest gear, your most prized possession is probably that dog-eared and well-thumbed copy of *Keyfax*, by Julian Colbeck.

Well, the best is yet to come, in the shape of the new edition of *Keyfax*, *Keyfax 3*, being published by the Books division of Music Maker Publications, who also publish the superior missive which is even now clasped in your sweaty palms...

Keyfax 3 is bigger and better than ever, with over 200 A4 pages, containing specifications and reviews of over 300 different instruments; it's a unique guide to what's currently available in the world of synths, samplers, controller keyboards, sequencers, software and home keyboards - with a glimpse of what will be available in the months to come.

Can you afford to be without it? At £10.95, I should say not.

Keyfax 3 is available direct from Music Maker Publications at the usual address (please add £2 for postage

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and packing) or if you'd like a personally signed copy, Julian Colbeck will be on the Music Maker stand on

all three public days of the British Music Fair, between midday and 1pm. ■ Dp

PROJECT MUSIC CLUB

You may well think there's not much to be said in favour of setting up home in that barren wasteland known as Hounslow. And if it wasn't for the recently formed Project Music Club you would be right. Evolving from a lazy Saturday afternoon get-together in the Project Electronic Music shop in that very suburb, the PMC meets on the last Wednesday of every month at the Hope And Anchor pub, Upper Sutton Lane, Heston. An average night starts at eight o'clock, and turns into an impromptu jam session by the time the first few beers have sunk. There are also demonstrations - the next one by Jay Stapley of Roland who will be highlighting the virtues of the ME4 foot pedal on July 27th.

It is to be stressed that these are not nights of hard sell, merely social gatherings for local musicians, offering the opportunity to try out a range of the latest keyboards, backline and PA equipment. For information on how to get there, phone Jim St Pier at Project on 01-570 4444 ■ Db

ARTY CRAFTY

If you can't quite stretch to the new ART ProVerb 200, but would really like to take advantage of the 200 presets on the new version of the popular ProVerb, Applied Research and Technology are offering owners of the original ProVerb the opportunity to upgrade.

The upgrade modifications can be retrofitted to any existing ProVerb, and will centre on the addition of an auxiliary circuit board and EPROM, that will replace the RAM system with a new RAM chip which has a built-in battery back-up board.

The software replacement includes 90 new reverb presets and must be carried out by returning your ProVerb directly to Applied Research and Technology.

More from Harman UK, Mill Street, Slough, Berks SL2 5DD. Tel: (0753) 76911. ■ Dp

TICKETS FOR THE ARC

Advanced Recording Concepts, never long away from these pages, it seems, are announcing two shows they'll be hosting during August.

The first is the MCMXCIX software surgery, where MCM will be showing all their software, and ARC will also be demonstrating competing software from C-Lab and Steinberg. So everyone gets a fair go. The software surgery will be held on Saturday the 13th of August.

8

KURZWEIL KARTRIDGE

Yet more updates for Kurzweil owners take the form of an intelligent music cartridge for the Kurzweil 250.

The RAM cartridge contains 1/4 of a Megasample of RAM for up to 5 seconds storage of user samples at 50K, or 10 seconds at 25K, or adds an additional 30,000-note storage capability for sequencing.

The update means that instead of having to save user samples to an Apple Mac, running Kurzweil's Quick Load System software, user samples can now be downloaded direct to cartridge. Thus the computer becomes an optional storage medium.

Version 6.0, which is the latest version of the 250's software, will also greatly enhance the K250's ease of programmability.

More from Carl Spencer International, Potash House, Drayton Parslow, Bucks MK17 0JE. Tel: (029 672) 787/8. ■ Dp

Sunday the 28th of August sees the Roland System House show, featuring demos of the new R880 reverb and E660 Parametric EQ, the first equipment from the newly-formed Digital Audio Division. Also on demo will be the S550, D550, P330, MC500 MkII and DIIO.

What's the best bit of all this? Tickets are absolutely free.

More from Advanced Recording Concepts, Bell House Studios, Turk Street, Alton Hampshire GU34 1EF. Tel: (0420) 541199. ■ Dp

IT'S THE BIZ

Monkey Business Music Shops of Romford, Southend and Bexleyheath are announcing the first "Hands On Show" to be held at the Dolphin Centre in Romford from October 7-9th.

You can expect to see loadsa big names there, including Aces, Gigsville, RSD, Pearl, Sound Technology, Roland, Harman, Akai, Peavey, Yamaha, Korg and many other stars of the heady musical firmament, not forgetting Yours Truly, Music Maker Publications.

Three separate areas in the

Dolphin Centre have been set aside for the show, two exhibition halls and a third hall hosting non-stop roadshows, demonstrations and masterclasses, which will be held throughout the weekend. Leading clinicians have been booked, and sessions will take place on various guitar styles, recording techniques, vocal harmonies, bass playing, drumming, computer programming and so on. Sounds like something for everyone.

Evening concerts and a music auction will also be happening, and a full catalogue of events will shortly be available. For further info now, contact Roger Channing on 01-304 8638, or write to Monkey Business at 66 Victoria Road, Romford, Essex RM1 2LA. ■ Dp

ARS UPDATE

The Spanish synth wiz Michel Huygen, who records under the name Neuronium, has been confirmed as the main act at the 6th UK Electronica, this year held in London (see last month's Newsdesk for further details). Also announced is the participation of Roland, who are to be major sponsors of the event and who are to provide much of the equipment needed.

Well done guys.

More from Mark Jenkins on 01-885 5665. ■ Dp

THE TRUTH WILL OUT

The postman is getting a bit brassed off staggering over from Cambridge with sacks of adoring fan-mail from you the readers. Consequently, we've decided to let you in on the secret: MT staff have founded an alternative cultural centre in the heart of the mysterious fens. In future, please direct your communications to the new MT editorial address of Alexander House (Yes, we picked it up and carried it here), Forehill, Ely, Cambs CB7 4AF. Have a nice day. ■ Dp

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YAMAHA DX7 Mkl, S/H.....	£575
YAMAHA CS80, S/H.....	£199
YAMAHA PF10 Piano, S/H.....	£399
ROLAND SH101, S/H.....	£99
ROLAND MC202, S/H.....	£89
ROLAND TR606, S/H.....	£69
ROLAND TB303, S/H.....	£89
ROLAND MKS7, S/H.....	£399
ROLAND JX3P, S/H.....	£399
ROLAND Juno 2, S/H.....	£599
ROLAND Jupiter 6, S/H.....	£699
ROLAND S10 (with case).....	£550
ROLAND D110.....	£785
ROLAND D10.....	£1,150
ROLAND D20.....	£1,280
ROLAND S330 Rack Sampler.....	£699
ROLAND MKS70 Anal Rack.....	£1,280
ROLAND JX10(2).....	£2,300
ROLAND S550.....	£POA
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ROLAND RD250S/300S.....	£POA
ROLAND HP(S) Range.....	£POA
ROLAND MT32.....	£450
ROLAND MT32, S/H.....	£325
CASIO CZ1000, S/H.....	£225
CASIO CZ3000, S/H.....	£369
CASIO CZ5000, S/H.....	£499
EMAX Range.....	£POA
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CHEETAH Mk7VA.....	£399
CHEETAH Mkl, S/H.....	£89
ENSONIQ Mirage Rack, S/H.....	£699

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ROLAND TR505, S/H.....	£150
ROLAND TR505.....	£199
ROLAND TR626.....	£350
ROLAND TR707, S/H.....	£299
ROLAND TR727 Latin, S/H.....	£199
CASIO RZ-1 Sampler Drumco, S/H.....	£199
YAMAHA RX11, S/H.....	£299
YAMAHA RX17, S/H.....	£225
ALESIS RX17, S/H.....	£225
ALESIS HR16.....	£449
ALESIS HR16, S/H.....	£349
ALESIS MMMT-8 Seq.....	£299
ALESIS MMT-8, S/H.....	£225
KORG SQD-1 Seq, S/H.....	£345
KORG SQ-8D Seq.....	£299
ROLAND PR100 Seq.....	£399
ROLAND BX600 Mixer.....	£170
ROLAND BX800 Mixer.....	£225
ROLAND BX16 Mixer.....	£450
DESCITECH 6:2 Mixer.....	£225
DESCITECH 12:2 Mixer.....	£360
DESCITECH 16:2 Mixer.....	£435
TASCAM Rec Mixer, S/H.....	£
NOMAD Axeman.....	£299
NOMAD Bassman.....	£375
NOMAD Lite 19.....	£69
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Software

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DIGIDESIGN Turbosynth, etc
TURTLE BEACH 3-in-1, etc
C-LAB Creator, etc
ATARI 520/1040 Package Deals
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INTERFACE

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

Q Instead of the usual moans and groans about equipment, all I want is a little information concerning a group who seem to have slipped from the public eye.

Just what has happened to Ultravox and its members since the release of their last LP nearly two years ago?

We all know that Midge Ure has been busy with Live Aid and the Nelson Mandela Birthday Concert, but what of the other members of the band (who have all said at one time or another that they are going to do solo projects) and, more importantly, how about a new LP release from Ultravox?

I'm a big fan of the group, and they've been a major influence on me so I don't want to see them simply fade away.

Lastly, bring back Warren Cann - Ultravox isn't Ultravox without him.

■ Andy Greenwood
Deeside

A Well, the first vinyl you can hope to see emerge from the Ultravox camp is Midge Ure's next solo album. It's already recorded and scheduled for release sometime in the autumn. Following that, there should be a long-player from the band (all playing together for a change) but there's no provisional release date for that as yet.

Apart from this, Ultravox's record company, Chrysalis, don't really seem to know too much about what the various members of the band are up to. As for Warren Cann - Warren, are you out there? Your public needs you. ■ Tg

Q I have just bought a Casio FZI, which I think is a brilliant machine. However, my problem arose when I wanted to purchase a sound library. I tried several suppliers and was quoted between £17 and £20 a disk!

Most musicians are not rich, and at these prices you would have to spend several hundred pounds to achieve anything near a decent library.

In the end I resigned myself to the fact and purchased several disks, but found that they only

contained between one and four banks of sounds, and these made little use of the eight looping points available. So come on all you sampling experts, please make more use of the FZI's capabilities and justify the high prices you charge.

On a more positive note, on the recommendation of a fellow FZI owner I purchased nearly the whole library of a company called Prestige Micrographics (I ran out of cash in the end). All their disks contain eight full banks, cost less than half the price I was quoted by other companies, and the samples sound fantastic. So if they can do it, how about all the other "specialists"?

■ Alan Moore
Bexleyheath
Kent

PS Prestige Micrographics can be contacted on (0799) 23415.

A Thanks for passing on the benefits of your experience. Incidentally, are you aware that there's an FZI Owner's Club?

They produce a monthly newsletter which includes owners' hints and tips, patches and library lists, sell both branded and unbranded blank HD disks, and maintain a library of public domain and specially-commissioned samples. Annual membership is £25. If you're interested then I suggest you write in the first place to The FZI Club, PO Box 435, London E10 5HE and ask for their information sheet (which includes an application form). ■ St

Q I am looking for a computer primarily for MIDI work, but also for word processing and possibly even CAD.

Whereas the Atari ST has definitely been adopted as the music computer, I am told the Amiga is much more capable in terms of multi-tasking and colour (incidentally, I have seen and love the painting program).

Looking back through my past issues of MT I could find no reviews of music software for the Amiga, only occasional references to it in adverts.

As you are well aware, computers that aren't

adopted on a vast scale inevitably suffer a slow death. Do you think the Amiga will be one of those? Where can I find out about music software for the Amiga, or should I just forget it and buy an ST instead?

Thanks in advance,
■ John Adams
Norwich

A The ST has firmly established itself as the MIDI computer in the UK by virtue of accessible pricing and a healthy range of MIDI software. That doesn't mean it's ultimately the best computer for musical applications, but the power of the software available for it now is more than enough to keep most people happy. Rest assured there's more to come, too.

The sheer amount and variety of MIDI software for the ST has led to a demand for multiple program environments and, by extension, multiple tasking. Ultimately this trend, which is also leading towards a workstation concept of combined MIDI and digital audio recording, will stretch the ST to a point beyond which it won't go.

MT has concentrated on the ST over the past two years because it has been the most accessible 16-bit computer for many musicians, and has developed (and is still developing) a large library of powerful MIDI software. The arrival of Amstrad's budget PC-compatibles offers one alternative, and we've recently given more coverage to PC software (the amount of PC software being imported from the US is growing, too).

As far as the Amiga goes, there hasn't been a great deal of MIDI software available, and the Amiga has always been priced more highly than the ST. That situation is starting to change, and with it the computer's popularity is slowly growing. A package of A500 plus memory upgrade to 1Mb and a colour monitor now costs £699 including VAT, while a MIDI interface is available from MCM for £25. That brings the Amiga for the first time into direct competition with Atari's 1040ST.

MCM are the main distributors of Amiga software in the UK. Currently they sell the following range of Amiga software from Dr T's: KCS v1.6 sequencer, MT32 editor, D50 editor, DX7 editor, Four-Op Deluxe (a generic four-operator FM editor), all three versions of the Copyist scorewriter program, D110 editor, Kawai editor, Matrix 1000 editor, Fingers and MRS (their budget eight-track sequencer).

Also available through MCM now are the Sound Quest range of editors: TX81Z, DX11, MT32, SQ80, DX711, D50 and CZ, together with a generic patch librarian. Expected during August is Intelligent Music's M, while Passport's Master Tracks Pro and Master Tracks Junior will follow in September.

Note that these software houses are all American. The Amiga's Stateside profile has always been higher, simply because in the States it has never been regarded as a high-priced computer.

Clearly the range of MIDI software for the Amiga isn't as great as that for the ST, but it does appear to be growing. The Amiga is more powerful than the ST - for instance, it's capable of running several programs concurrently (what's more, they don't have to be by the same manufacturer) and of having a much greater number of windows open than the ST's four. Its graphics capacity is greater than the ST too, and may well be more suitable for CAD applications.

If you wish to pursue the Amiga direction further, give Dean Cook at MCM a ring on 01-258 3454. ■ St

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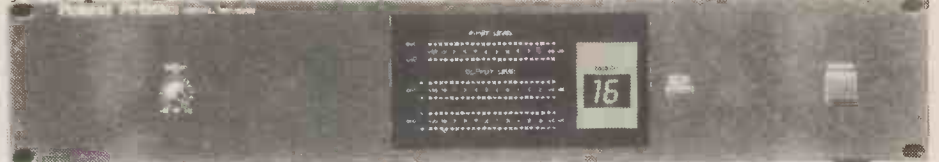
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COMMUNIQUE

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Dear MT

The Spice of Life

The Communiqué page in June's MT highlights the reasons why I personally think that, as a musical "event", the '80s will disappear without trace.

Every once in a while, some mad bugger writes in to you saying "come on folks, let's not forget the music." But far too often this only means one sort of music. Thus you have three men (John, Joe and Chris) getting annoyed over the same thing while seemingly being totally at odds with one another.

What we need now more than anything else is composers who enjoy, and can learn



from, all types of music, yet can still stamp their very own mark on their compositions. Too many people never move beyond the music that they enjoyed in their adolescent years, whether that music be jazz, classical or pop. It can be hard work, but we must

all strive to diversify and to appreciate the efforts that others make.

What is the point of trying to compare Led Zeppelin to Chick Corea to M/A/R/R/S to Tiffany to Dolly Parton to Bob Dylan to Mozart (whew). Each type of music works, to varying degrees, within the confines of its own idiom, and should be appreciated on its own terms. Listening to 400 house singles is all very well, but slip in some John Cage, Barry Manilow or Bix Beiderbecke and things will start to get really interesting.

Re the sampling issue: sampling is still new and therefore exciting. Give it time and it will become just another weapon in a vast armoury. For some it already is.

And finally, my thought for the month: a sequencer is surely nothing more than a musician over which the operator has complete control. The end really does justify the means. Here's to the 1990s.

■ C Livingstone-Lubwama
Thornton Heath
Surrey

Dear MT

A Talent to Enjoy

I was interested, intrigued even, to read recently yet another thoughtless attempt at reinforcing the "my music is better than your music" syndrome, this time by John "I'm a mega keyboard player and anyone who can't play like me is a big girl" Gambold.

I wish to say here and now that I am a "talentless keyboard player" who is enjoying himself immensely with synths, drum machines and sequencers. But I can see that, if it were up to the John Gambolds of this world, I would be taken outside and shot for my sins.

John, you'll be glad to know I am learning the art of music, and maybe one day I will be able to play dominant seventh flattened ninth arpeggios at 150 bpm (go on, you're impressed, aren't you), but, until then, may I be left alone to enjoy playing and recording boppy commercial music?

After all, enjoying making music is what it's all about, surely.

■ Martin Ayrton
Thornton
Blackpool

PS. Notice that I've been able to get through a complete letter without once bragging about my equipment (musical, that is) or telling the world about my favourite band/producer/underpants.

Dear MT

For the Love of Music

I've been an MT reader since its first appearance as E&MM, and in all that time I've never been prompted into writing. But now the recent bewildering and unproductive argument about computers vs. players and good music vs. bad music has changed that.

So far I think we have established that music as an artform must be appreciated subjectively. This suggests to me that the question to be asked about any musical work is: do I like this or not? If you have to know how it was produced then surely you're not really appreciating the music itself. Are people like John Young any different from any other creators of music? The criteria for judgement is purely and simply: why do they create?

My opinion is this: to create music for the love of it is right, but to create music purely for financial gain is crazy. If music created through love also happens to earn you a fortune, great. What seems to bother John Young is that other people who can't play as well as him are making a lot more money than he is. Don't get me wrong, I'm not dismissing all his points, I'm just saying that perhaps he and others who think like him have doubtful motives for their resentment.

I love to hear great musicians such as Paco de Lucia, Marcus Miller, Mike Stern and Billy Cobham take off into an exciting improvisation, but the same emotion is aroused in me when the sequencers take

MUSIC TECHNOLOGY AUGUST 1988

over in a Tangerine Dream set. I've no idea why and I don't think it matters.

The electric guitar was an upstart instrument once, and it was used to make music which in its time most certainly made the floor move. Maybe at first it was poorly played, but the result was exciting enough for it to survive and gradually find its way into the hands of musicians who could really develop it. How do you think Charlie Parker, Miles Davis, John Coltrane and Julian Adderley felt when rock 'n' roll was making money while they pursued their respective artistic dreams?

In enjoy making music. It's important to me, and in the unlikely event of my making some money out of it I'd be a happy man. But at the same time I don't resent anyone else making loads of money from a medium I love.

Yours homeless and jobless

■ R Hedger
London

Dear MT

Matter of Fax

letter of the month

FAX TO:

Simon Trask, Assistant Editor

I couldn't resist telling you. I wrote the Operation Manual for Steinberg Pro24 III, and I am definitely Swedish, neither German nor English.

May God forgive my vanity.

Kind regards

■ Ernst Nathorst-Boos

Synkron Music and Data
Stockholm
Sweden

Dear MT

The Practice of Theory

In recent months many letters have been sent to *Communique* concerning the sorry state of the audio arts, specifically the obsessive attention devoted to the sounds on a record, and the machines used to make those sounds, at the expense of the musical content.

It's fine for you to print these, Mr Editor, but what are you actually doing about the problem? I've been a reader of your magazine for years, but I cannot remember ever reading an article about music. I'm not saying that you are to blame for this shift in emphasis, despite the fact that a while ago you removed the word "Maker" from your name and replaced it with the word "Technology", but you're not exactly bursting a gut trying to improve the situation, are you?

You're in a perfect position to enlighten people as to the mysteries of modern music. Surely there must be someone out there whose writing would benefit from a basic understanding of music theory. Even if you only succeed in enabling someone to steal a riff in the right key from a James Brown album, or in persuading a synthesist to use a different chord inversion instead of a different sound, it will be worth it. So how about a mini-series on music, before the word "Music" disappears from the cover and we are just left with "Technology".

MUSIC TECHNOLOGY AUGUST 1988

Now, I suppose this letter will provoke the usual round of cliché-ridden replies from individuals who will accuse me of trying to give people what they ought to have rather than what they want, and who will defend their right to be ignorant by justifying their preferred writing method of messing about until they find something that fits, so I'll save them the cost of a stamp and answer them now.

Not knowing what you are doing is a valid method of writing if you are planning to spend the rest of your life messing about in your bedroom, but it's certainly not a very professional attitude to take if you want to make writing music your career. There's nothing wrong with having fun, but fun won't feed you. If you want to earn a living from your efforts then sooner or later you'll have to do some work, and knowing a minim from a mode might mean the difference between collaborating with Kate Bush and drawing the dole. That's it.

■ Richard Webster
Sheffield

You've correctly observed that MT's title embraces music and technology, Richard (may I call you Richard?), but you've missed the fact that we didn't include the word "theory".

A little more musical education might well improve the general state of music, but the truth is that there are plenty of books (not to mention teachers) already dealing with the theory of music. Instead, we've chosen to keep people informed about the technology that's currently playing a part in making music and the people that are using it. We're the only magazine currently doing this so rest assured that music will never disappear from the pages of MT. ■ Tg

Dear MT

Source of Invention

Over the years, the letters page has been the scene of numerous long-running arguments, but surely none as emotive as the "technology is killing music" theme of recent months.

However, critics of hi-tech music-making are missing the real issue. Technology is not killing music. The problem is simple: much of today's music lacks originality and compositional skill. That's not to say everyone needs to go to music college, because some people are naturally gifted, and such training could restrict their spontaneity. Technology can rightly be the servant of the modern musician, but it will never make him better at song-writing if he's lacking imagination in the first place, and it should never be allowed to become his master.

When an undiscerning public buys records with one criterion in mind ("can you dance to it?"), there is little incentive for musicians to write anything more than a relentless disco beat with a suitable bassline and a few hooks. After all, such records sell well, don't they?

House music recognises this, though it's mostly the work of other artists anyway, and the linking material is generally not particularly enthralling, often having two melody notes less than the number of

chords in a Status Quo song. Although house is a bit different from previous styles, it lacks real musical originality. I'm not suggesting it doesn't require skill to produce, but that alone doesn't make it original. It's interesting to note that most songs with a well-written melody and a decent arrangement still manage to chart even when they don't fit in with current musical fashions.

At the tender age of 36 I find there are still some chart records I'll buy (my tastes include most styles, from Strauss to Sugarcubes), and I endeavour not to write off any musical trends out-of-hand; most have something to offer. However, it must be said that, despite the wealth of hi-tech machinery in use, current chart songs are far simpler compositions than much of the somewhat wider choice of music available in the '60s and '70s. It's not technology which has caused this, but market demand.

Like Jens Meurer (*Communique* July '88) I find few things more irritating than blatant miming on TV or - even worse - at a concert. But (except in the event that extra musicians are available) I take issue with Jens on the subject of sequencing, simply because I don't know many people who have more than two hands.

At the end of the day, surely the only standard we can judge by is whether or not the music is skilfully written and well-performed. Maybe the public need to be made aware that there is more to music than just thunderous dance beats. Songwriters, it's up to you.

■ Steve Clark
London

Dear MT

Service U Need

Over the months that I've been reading *Music Technology*, I've noticed how often people write to you complaining about service or about equipment they've bought. Well, I felt it was about time I wrote to you to praise a company for a change.

Umusic are one of the few companies I've dealt with who seem genuinely concerned about after-sales service and help with any problem. I originally purchased their UMI 3S MIDI sequencer/interface package for the BBC micro and found myself experiencing problems, as my Roland JX's insistence on sending All Notes Off commands was causing havoc with overdubs. Several letters and a 'phone call later and my problems have been solved. Although I've decided to upgrade to UMI's 4M Professional system, Umusic's Linton Naiff was most helpful, even offering to modify the software specifically to cure my problem.

As far as I am concerned, the UMI system is the best computer-based sequencer that I've used, and as all the software is blown onto EPROM there are no copy-protected disks or dongles to worry about, making my life a lot easier.

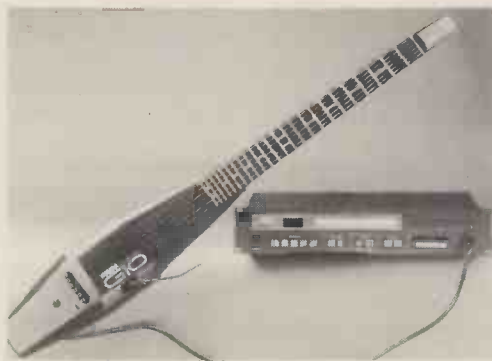
It's good to see a British company providing equipment for British musicians for a change, and what's more with such excellent service too.

■ KJ Bearman
Evesham
Worcs

Yamaha

G10

MIDI Guitar System



THE HISTORY OF instruments attempting to allow guitarists to play synthesisers is not a pretty one. From the mid-'70s' infamous and ill-fated ARP Avatar to the SynthAxe and Stepp guitars, quite a few manufacturers have bet and lost on their invention being the one to connect a million guitar players to the joys of synthesis.

A few months ago, however, a great deal of hope and anticipation was created by the announcements from companies (notably Passac, Beetle and Zeta) claiming to have overcome the technical hurdles that prevented most guitar synth systems from working in a way that makes sense to guitarists. Finally, it seemed, guitarists were going to have several workable alternatives for making the leap to MIDI. Strangely enough, some of these same companies are now starting to hedge their bets, saying that the MIDI guitar market is never going to reach the proportions that they originally imagined.

Meanwhile, Yamaha quietly continued to work on their MIDI guitar controller – an instrument that others also felt would be the answer for guitarists looking to take part in the MIDI revolution.

With the imminent release of the G10 Guitar MIDI Controller and GIOC Guitar MIDI Converter, it's clear that the price alone will prevent the new Yamaha system from becoming a standard addition to most guitarists' equipment collections. On the other hand, it does appear to be a significant addition to the professional market.

The approach Yamaha have taken with the G10 and GIOC is that of a dedicated MIDI controller. It uses a single set of .016 gauge (standard G-string) undamped guitar strings and has no conventional pickups or output jacks (and therefore produces no sound of its own).

The technology used by the G10 system to convert guitar performance into MIDI data (which bears a striking resemblance to the system used in the Beetle Quantar) is the main thing that helps separate it from the rest of the field. To quote the Yamaha propaganda, "An ultrasonic sound is transmitted along the strings and the fingered fret is determined by analysing the reflected wave – sort of a musical 'sonar' system". The whole process supposedly occurs in well under a millisecond so that no delays of the type found in systems which use pitch-to-MIDI conversion occur. The velocity of the note is determined by a separate electromagnetic pickup, referred to by Yamaha as a string velocity sensor, and a third pickup, using "optical shutter" technology, is used to detect string bends.

The three pickups work in tandem to produce a system which is supposed to be able to accurately track such things as muting, bends, hammer-ons and pull-offs. Although not yet thoroughly tested outside Yamaha, the system seems to do an excellent job of tracking.

The G10 guitar connects to the 2U-high rackmount "brain" of the system, the GIOC, via a special seven-metre

lead. The signals from the guitar are then processed and sent out of the GIOC's MIDI Out port (it also has a Thru port and an In for SysEx dumps). Though it may provide more flexibility, this two-piece system seems more cumbersome than the all-in-one approach taken by the Casio MIDI guitars and the Beetle system. They both allow you to connect a MIDI lead straight from the guitar into whatever synth you're using. Other connections on the GIOC include jacks for a single footswitch and a single footpedal, which can be assigned to control a variety of parameters per G10 program, and two jacks for the increment and decrement system of stepping through the 64 G10 programs (an additional 64 can be stored on an external RAM4 cartridge).

You can also select synth programs from the G10 itself, which has two program select buttons along the bottom edge of the guitar and an LED near the top edge to show you which program you've selected. Next to the program inc/dec buttons are two programmable control wheels – like miniature pitch and mod wheels – which can be assigned to such functions as volume, modulation, portamento time, panning, and so on. You can also assign the whammy bar to performance controls like pitch-bend. In addition, the G10 features an overall sensitivity control (the GIOC features individual gain knobs per string) and a breath controller input. All in all, pretty extensive performance control.

Programs on the GIOC include volume, transposition, velocity curve (four preset and four programmable) and MIDI channel per string, mute level, program changes, controller assignments and other parameters.

Though the GIOC does not produce any sounds of its own, within its memory Yamaha has stored a special group of patches and performance parameters for the TX8IZ and TX802 synth modules – designed and programmed to be used specifically with the G10 system. You can dump these into the respective synths via the GIOC's MIDI Out. It's a tricky little incentive to buy a Yamaha synth as your sound source. Smart, too, in that anything other than a keyboard controller needs something other than keyboard-orientated patches to best show it off – and Yamaha have always tried to provide plug-in-and-go systems to their customers.

The odd shape of the guitar and the system's anticipated price (it retails for \$2499 in the US) may make the G10 a tough sell for Yamaha. But it wasn't the shape of the Synthaxe and Roland's GR700 that disappointed people and if the G10 works well as an expressive and effective controller, these considerations may not matter. Only time will tell. ■ *Bob O'Donnell*

Price TBA

More from Yamaha, Mount Avenue, Bletchley, Milton Keynes, Bucks MK1 1JE. Tel: (0908) 71771

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PLAYERS

CHRIS HUGHES record producer. His work includes the first two Tears For Fears albums and Adam And The Ants. Chris started his career as a drummer consequently the timing and the feel of the equipment he uses is of the utmost importance as a result of these demands Chris chooses to use Mark of the Unicorn's **PERFORMER** and intelligent music's **UPBEAT** for his sequencing. When it comes to editing and storing his sound he uses **OPCODE** editors and librarians.

HOWARD JONES runs a lot of his synthesizers from a **MACINTOSH II** and like Chris he has chosen to use **PERFORMER** and to score outparts for musicians, he uses it in conjunction with **COMPOSER**.

WIX is a well known session musician having played on many hit records. For his sequencing he runs **PASSPORT MASTER TRACKS PRO** on the Mac with its superb graphic layout and to edit samples he too uses **ALCHEMY** and for his synthesizers a mixture of **DR T** and **OPCODE** editors. **RUPERT HINE** and **ALAN PARSONS** are record producers both choose to run **PASSPORT MASTER TRACKS PRO** on their Atari computers. **DANIEL MILLER** who is well known for his production of Depeche Mode and Erasure on the other hand uses **DR T'S KCS** as does session musician **JO GLASSMAN**. Producer **ANDY RICHARDS** and Living In A Box writer/producer **STEVE PIGGOTT** synchronize with the **SRC AT**. Propaganda and Frankie Goes to Hollywood producer **STEVE LIPSON** also uses the **SRC AT** and is the owner of an ultimate support system built to his own specifications.

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Ensoniq EPS Sampler



THERE'S NO DOUBT that Ensoniq's Mirage sampler was the right product for the right price at the right time. But the situation is very different for the company's second sampler: price-wise it doesn't stand out like its predecessor did, and there happen to be an awful lot of good samplers currently out on the market.

Most people would agree that the Mirage was a right pain to operate, and the manual didn't help. Fortunately, through the ESQ1 and latterly the SQ80, Ensoniq have developed a very proficient user interface and spruced up their manuals no end. One of the EPS' strong points is undoubtedly the fact that it's extremely user-friendly – to the point, even, that you don't need to refer to the manual that much.

The EPS sports Ensoniq's own Poly-Key polyphonic aftertouch-sensitive keyboard (as already used on the SQ80). Its rather odd "clackety-clack" touch isn't at all appealing to begin with, but I found that I got used to it after a while.

As on the Mirage, Ensoniq have gone for a disk-based operating system, requiring the operating system disk to be in the drive each time you power up the instrument. You can make backup copies of the OS disk, and – unlike the original Mirage – format disks onboard the EPS (the sampler uses DSDD 3.5" disks, with formatting taking about 80 seconds).

Sample resolution isn't a simple matter, for while the input and output converters are 13-bit linear (supposedly giving a 78dB s/n ratio) the samples are stored in memory as 16-bit data while the chips handling the filtering and mixing are 24-bit. Whatever that's supposed to add up to, the EPS has a bright, clear sound with plenty of presence. The six library disks available at the time of writing include a very realistic and expressive flute; drum and Latin percussion kits; a bright, metallic-edged electric piano; snappy digital bass; a very plaintive zither; and a variety of delicate, splashy metallic and atmospheric sounds.

The sampler allows you to choose from 40 sample rates ranging from 6.25kHz to 52.1kHz. The polyphony of the instrument depends on sample rate, simply because the output is multiplexed, which means the voices are time-sliced. The faster the playback rate the fewer the voices which can be processed. You get three choices: 20 voices at 31.2kHz, 16 at 39kHz and 12 at 52.1kHz.

The EPS comes with 512K of onboard memory (256K of 16-bit words) which gives you 9.92 seconds sample time at the maximum sample rate of 52.1kHz, or 12.52 seconds at 41.7kHz. You'll be able to double this memory capacity with an add-on memory board, but plans to produce bigger memory upgrades have apparently been scuppered by high memory-chip prices.

Like the ESQ1 and SQ80 before it, the EPS has an onboard eight-track sequencer. This allows you to record up to 80 999-bar sequences and then chain them together

into a single song. Tracks can be mixed down, muted and solo'd, and given mix levels and pan settings. The EPS utilises pretty much the same track-to-MIDI organisation as the ESQ1 and EPS, whereby each track can be assigned its own MIDI channel and set to internal, MIDI or both.

What you do have to come to terms with on the EPS is the fact that memory is dynamically divided between samples and sequences. If you were to use the memory solely for sequencing (which really isn't very likely, is it) it would hold around about 80,000 notes. Roughly speaking, each Block of data (512 bytes) holds about 80 notes (pre controllers).

As on the SQ80, Ensoniq have included a straightforward SysEx Recorder which is suitable for all instruments that allow you to initiate dumps from their front panel.

Sampling on the EPS seems a fairly straightforward process, with "expert system" auto-looping and six different crossfade looping algorithms doing their best to help you get smooth loops. Up to eight Instruments can be held in memory at any one time, and these can be organised on the keyboard in any fashion and "stacked" in any way. Each Instrument can contain up to eight Layers, a Layer being a group of wavesamples spread across the keyboard. Layers can in turn be combined into four Patches which can be called up via two dedicated Patch buttons above the pitch and mod wheels – the idea being that you can very quickly switch between different sounds or variations on the same sound(s). This may not be the most intuitive part of the EPS, but it's certainly very flexible and musically very useful.

The feature on the EPS which most people are aware of is probably its ability to load a sample while you're playing other samples on the keyboard. This works fine, and with careful memory planning can effectively expand the EPS' internal memory, but it's a shame Ensoniq didn't extend this ability to other disk operations such as loading sequences or formatting disks.

Mirage owners who are thinking about upgrading to the EPS should know this: Mirage samples can be loaded straight off disk into the new sampler and converted into EPS Instruments. Your precious sample library won't become redundant.

Initial impressions, then, are that the EPS' combination of excellent sample quality, user-friendly operation, a host of thoughtful features and a flexible onboard sequencer make it definitely a sampler to listen out for – though I think I'd go for the memory upgrade option pretty quickly.

■ *Simon Trask*

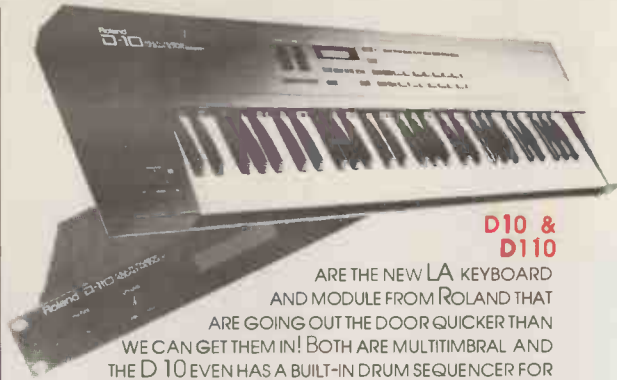
Prices EPS £1575; ME1 512K memory expansion board £195; OEX8 eight individual outputs £195. All prices include VAT

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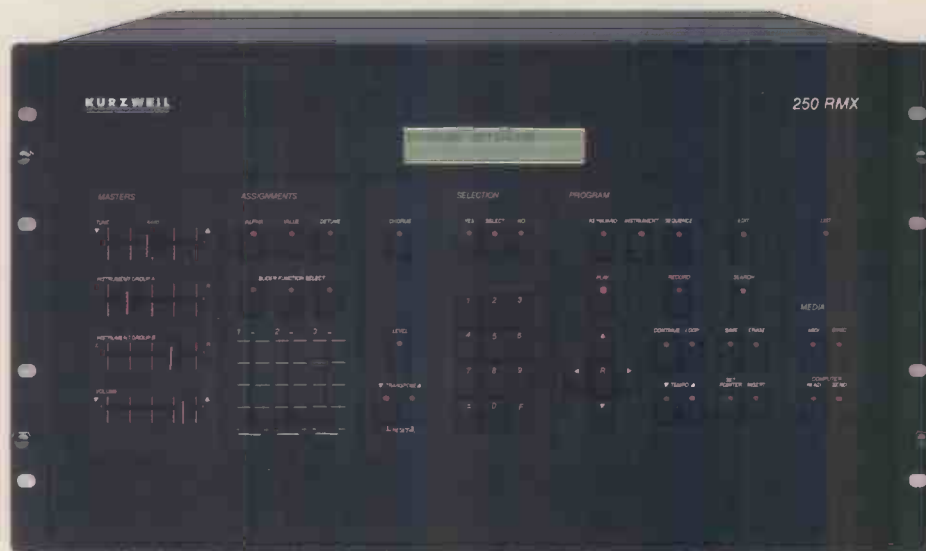
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single



Illustration Clive Goodyer

The record industry is deaf to your talents and you've decided to ensure your success by pressing your own single – where do you start and what will it cost?

Text by David Bradwell.

IT'S A FUNNY old game, life. On the one hand, yer average record company seems intent on extracting as much cash out of the record-buying public as possible. On the other, when you tell them you possess an advance cassette copy of this year's best selling single, they appear, at best, totally disinterested.

At this stage of the proceedings there are two courses of action open to you. The first of these is illegal; the second is to release your pop masterpiece as an independent record, and in so doing rake in all the cash for yourself. Infinitely preferable, I'm sure you will agree. But how is the deed accomplished? Read on, dear public, this feature could make of you a megastar . . .

The first consideration is to find the

right studio – to decide whether you want four, eight, 16, 24, 32 or even 48 tracks to record on – decide how much you can afford to spend and what formats you want to release your finished production on. Hugh Griffiths of Remaximum studios in South London (01-627 3507), where Judy Boucher recorded her No. 2 single, 'Can't Be With You Tonight' for £150, stresses the importance of feeling at home in the studio of your choice and of talking to the engineers to see if your musical interests coincide. The classified sections of the weekly music press contain a wide selection of studios on a regular basis, but taking Remaximum as an example, you have the choice of 16- or 24-track suites available at various rates depending on how long you hire them for. As a general

rule, studios become cheaper after the first ten hours, so reckon on about £15-20 per hour for 24 tracks, whereas a good eight-track package can be as little as £30 per day.

In case it all sounds too easy remember to rehearse your material thoroughly before entering the studio, and agree to leave all final decisions to one band member. Most importantly, do not rush, and before you leave, make sure you have tested your finished master tape on different sound systems, to see how it will be transformed by a mono medium-wave Radio 1 broadcast (Why talk small-time?).

If you feel a record producer would be of assistance at this stage of your career, you need a copy of the Music Week directory (accessible through your local

MUSIC TECHNOLOGY AUGUST 1988

library). Unless you're absolutely convinced you're in line for certain success try to avoid paying a producer a set fee. Opt instead for a percentage of the royalties – that way, everybody has the most to gain from the success of the venture. Hugh Griffiths, himself a record producer, warns: "People who are famous don't necessarily help or guarantee success, whereas a new up and coming producer who is hungry to be noticed will work to the limit".

On the Record

"IT'S A JUNGLE out there" has become just one of those sayings, but not many people know that it was first spoken in relation to record pressing. As this is the most potentially frightening and expensive area of the whole business, it merits special attention. The options available are staggering: 7-, 10- or 12-inch singles are all possibilities, but now CDs and even DAT are becoming increasingly prominent. And it's more than just vinyl as the sleeves and labels all have to be printed too, so you have to decide how many colours (if any) you want to see on the label and sleeve, commission an artist and deliver camera-ready artwork. Then the whole thing has to be coordinated – from the cutting of the acetate from your master tape, to the final printing and pressing. It's no good having a thousand records coming off the press with no bags to put them in.

May King records of Battersea (01-924 1661) offer a package which encompasses all the available formats, and will look after every stage of production once you hand over your finished master tape. One of their former clients was a band called M/A/R/R/S and we all know what happened to them. (They split up). As a rough guide on price, 1000 7-inch, white-label singles will set you back about £350; using two colours on the labels and sleeves increases the damage to £850.

According to May King Sales Associate Mike Turner, a top-quality master tape is of prime concern – either on ¼" tape or PCMF1 Beta or PCMI610 U-matic digital. Your label should include details of copyright, publishing, dates and a catalogue number for chart registration. To acquire this you have to ring Gallup and they will sort it out for you. If you plan to produce a CD, you need a master tape on either PCMI610 or 1630 tape which needs to be P and Q encoded (which is the pulse after each track which tells the machine where it is). If sound quality is your top priority and you can't afford CD, look for a pressing company which offers the thickest, flattest, virgin vinyl.

Direct Metal Mastering is, in the words of Mike Turner, "vinyl's answer to CD". It offers better quality than more conventional lacquer, and is cheaper for large quantities. As such it's worth bearing in mind, but you must remember that the most significant factor in the process is the quality of the vinyl itself.

"Record companies don't seem to take people very seriously unless they've already had a record pressed", observes Turner. He also recommends starting off with 1000 copies and then attacking the

press. If you can afford it, you can now shrink-wrap records with almost any gimmick you can think of.

Cashing In

ANY ROYALTIES FROM airplay or from nightclubs, juke boxes and so on, come through the Performing Right Society (PRS) and such royalties should be paid to you every time your music is reproduced in public. The drawback is that to become a member of the PRS you need to have had at least three songs either commercially recorded or performed in public or broadcast at least 12 times in the last two years.

An alternative is to land yourself a publishing contract. Companies like Chappell Music, who include Band Aid, Level 42 and Five star on their roster, will offer a publishing contract for one single. As long as they think it will be profitable...

Publishers may charge as little as 15% commission if they don't invest any of their own money – a small price to pay if you start earning airplay royalties, typically £50 for Radio 1.

Other revenue collecting companies include the Mechanical Copyright Protection Society (MCPS) and Phonographic Performance Limited (PPL). Both work zealously to protect the owner of the copyright.

Read All About It

YOUR SONG MAY be worthy of attention in its own right, but a small bit of tasteful publicity can get your name noticed and keep it in the minds of potential customers and the press.

The simplest forms of promotion are the most obvious – posters, pens and stickers, although sticking posters everywhere has been known to land people in a spot of legal "bother". Companies like Stage Three Promotions of Banbury (0608 737831) can save you the bail money by offering a service encompassing almost any promotional item you can think of: sweatshirts, Filofaxes and DJ slip-mats. The price of everything depends upon quantity, colours and size, with each client given individual attention with regard to the most effective use of available resources. William Shaw of *Smash Hits* says "If somebody comes to us with a good idea for a competition, we normally agree, as long as it's aimed at the right market". Such competitions guarantee publicity, but you have to be imaginative for best results. (Alternatively, forking out enough cash for a holiday for two in the Bahamas will ensure a favourable review in one Music Technology magazine. Contact D Bradwell, ext 163.)

To further develop an industry "buzz", you need to get your song heard and written about, so send copies to absolutely everybody – and that includes the music press. *British Rate And Data* (BRAD), published by Airtrade, lists every newspaper in the country, along with their circulation, cover price and editorial address. Send copies to every DJ and radio

producer and follow them up with requests. Invent things, be creative, listen to the radio and analyse what the DJs are saying (or reading).

Send additional copies to all of the nightclubs which play your sort of music and offer to follow them up with personal appearances. Don't forget in-store radio stations, juke box companies – everybody who could earn you some airplay. Alternatively, you could hire a record plugger to take your record to the radio stations on your behalf. Michael Peyton (01-731 1422) took The Firm's 'Star Trekkin' to Radio 1, and subsequently the top of the charts, and has since repeated this success with T'Pau. Pluggers can be expensive and don't guarantee success, but if you find a good one it can make all the difference. If you do manage to get any press exposure, hold on to the cuttings, as they will be invaluable if you decide to approach a major label at some future stage.

The Hard Sell

SO FAR YOU'VE got a master tape, which has been turned into a record, and you've got around 1000 of those, some of which have amassed you considerable publicity. The big gap is in actually putting the rest of them up for sale, either on your own or through a record shop. If your band have a large live following, there should be little problem in selling a reasonable quantity of singles at gigs. If you are being more ambitious, and that after all, is the whole point of gaining media exposure, you're going to need a distribution company to act on your behalf.

The Cartel is the largest group of independent distributors in Britain and are quite capable of taking records to

"We can play a record directly on the radio, whereas, if I like a tape we have to ask the band in to record a session, and there's a limited number of those we can offer." – John Peel

every shop in the land and selling enough to reach No. 1.

Backs Distribution (0603 624290) are one of the Cartel companies, and Derek Graham from Backs sees a distinct advantage for musicians whose records are distributed by The Cartel.

"Shops are often reluctant to take records off individuals but if they're coming from a recognised distributor it instills greater confidence," he says.

Ideally, you should approach the distribution company of your choice long before getting the records pressed. Some companies offer manufacturing and distribution deals, and in any case, there are certain distribution details which should be on your record sleeve – for example, where to obtain more copies. If you wish to export records to America, you need the words "Made In England" on the sleeve, label and any inserts – a detail, but one which could prove extremely costly if overlooked. The

► earlier you approach the distributor, the better, because it enables better planning of production schedules and press/radio coordination. To approach the company you need a professional attitude, and need to remember that the way you sell yourself to them will be reflected in the way that they then sell you to the shops. Each record is treated on its own merits and the stock level depends to a large extent on pre-sales. As such, a new band will be at a disadvantage because a shop is less likely to want records by a band it has never heard of, but by the time you have built up a reputation, their enthusiasm will have increased dramatically. As a rough guide, the distributor will charge around 30% of the dealer price, which is currently £1.99 for a 12-inch single, and £1.15 for a seven-inch. Records are taken from you on a sale or return basis, so don't spend the cash too quickly. Finally, as a rough guide, reckon on sales of about 3000 12-inch singles as a break-even point. Any more than that and mine's a Perrier. And don't ever approach an independent distributor with the attitude that your self-financed single is a stepping stone to a major contract - they will be less than amused. A good distributor can make you, a bad one can break you. It's worth remembering that.

If all of this has disheartened you, you may like to remember that you're not necessarily fighting a losing battle. In 1979, The Flying Lizards reached No. 5 with their single 'Money'. It cost a reputed £12 to record, and stayed in the charts for 10 whole weeks. More recently, Nu Shooz

had international success with 'I just can't wait', which started out as a private pressing, financed by the band, and played on their local radio station in America. In the last 12 months you'll have come across the aforementioned M/A/R/R/S, Bomb The Bass, S-Express, Star Turn on 45 Pints, Cold Cut, even The Timelords - all of which are successful new bands from the independent sector.

Radio 1's champion of the independent scene, John Peel, says he would rather receive a single than demo tapes. "... after all, we can play a record directly on the radio, whereas, if I like a tape we have to ask the band in to record a session. And there's only a limited number of those we can offer. Airplay is fairly crucial for mainstream chart success, but there are more and more records crossing over from the clubs."

Opportunities

EVEN IF YOU'VE arranged a distributor and all the publicity you could ever want, you may still find yourself hit-free. Don't despair - only five or so singles break through out of the 120 released each week, and you're competing with the likes of EMI, CBS and Virgin. Be sure you haven't lost out though, because you now have experience of the workings of the industry and an impressive portfolio of cuttings, airplay dates and the like to show talent-hungry A&R department heads. Virgin's John Wooler wouldn't lay too much emphasis on packaging, preferring

only to hear a good song. As such, he doesn't place too much emphasis on self-produced singles. Steve Proctor, formerly of Polydor's A&R department disagrees: "If a band appear to be approaching their music professionally, we are more likely to regard them as a serious proposition", he explains. "Sending out a record as opposed to a cassette increases the likelihood of being heard quickly by the right people. On top of that, the sound quality is likely to be better, and bands find it an advantage to know the mechanics of the business."

If you're feeling lucky, you should send similar packages to publishers, producers and managers, who should recognise your enterprise. Never sign anything without legal advice, however tempting.

The conclusion to draw from all of this is that you must know your audience and get your record to them. You must know your objectives; your goals must be realistic, yet ambitious. As Hugh Griffiths said, "There isn't a single way of doing it in the music business, it's a very open thing. There are no set rules as such, because everybody is breaking them."

The success of the song is decided in the studio, but the success of the single as a commercial venture has more to do with exposure and marketing than anything else.

Don't believe in automatic stardom, and beware of complacency as there are few second chances. As Neil Tennant of the Pet Shop Boys once sang, "There are lots of opportunities, if you know how to take them..."

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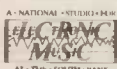
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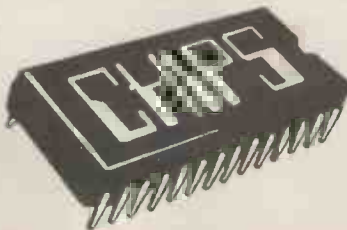
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DOCKLANDS

Rendezvous

On the eve of his record-breaking, technology-intensive Destination Docklands concert Jean Michel Jarre explains why computer technology represents the dark age of music. Interview by David Bradwell.

ON SEPTEMBER 24th, the otherwise quiet, remote East London Docklands will, for one night only, become the focus of the international media gaze. The occasion is the biggest concert the world has ever seen – and the next logical step in the spectacular career of Jean Michel Jarre.

Coming in the wake of similar extravaganzas in Houston and Lyon, the scale of *Destination Docklands* is unlikely to surprise followers of the enigmatic Frenchman. It's estimated that four million people will witness the event live in London and millions more will hear the simultaneous stereo radio broadcast both in the United Kingdom and abroad – statistics which will put Jarre in the record books.

It's three years since E&MM last interviewed Jarre (February '85). At the time, *Zoolook* had just been released and such live performances were just a dream. Today, however, I'm sitting in the back seat of a blue Mercedes, on a journey from BBC Broadcasting House to the location of the concert – on my left is the man himself . . .

Born in Lyon in 1948, Jean Michel Jarre first saw international success in 1976 with his second album, *Oxygene* (the first being 1970's

With the exception of the privately pressed *Music For Supermarkets*, Jarre released nothing more until 1985's *Zoolook* project. To this day *Zoolook* stands apart from the rest of Jarre's work as an experimental sampling record, less successful in terms of record sales, but marking a significant change in his approach. At the time he claimed to be tired of synthesiser music, and began using the Fairlight to construct samples of voices from different cultures around the world.

The open-air concerts in Houston and Lyon were documented by two albums – *Rendezvous*, which saw a return to conventional synthesis, and a live album containing the best moments from both events. The next release is to be an album of new music written for *Destination Docklands*, scheduled to become available immediately prior to the event itself.

I had arranged to meet Jean Michel in his London press office, a stone's throw from Marble Arch, but a flat tyre at TV AM has changed all that. He is already running late, and with a live appearance on Simon Bates' Radio One programme scheduled for 11.30, I am driven to Broadcasting House to meet him. By now the chaos is complete and I find myself in a Mercedes with an hour to find out all there is to know about Jean Michel Jarre.

At the time of his first E&MM interview (June '82), Jarre claimed to have plans for an outdoor concert in the UK at the end of August that year. "It's an old dream to be able to put together this kind of production in London", he agrees. "London is really one of the European centres for music and technology. I think there is not only a challenge, but that there is an opportunity to try to create a link of different techniques and talents, trying to keep the certain specificity of what we can do in France, but also using all of the local ability of this country."

PUTTING THE FORTHCOMING concert to one side for the time being, we discuss a subject of mutual fascination: Technology. For one of the leading figures in electronic music, Jean Michel Jarre has controversial views on the subject; in particular, he is unsure of the merits of computer-based sequencer systems.

"I think I was one of the first musicians to be involved with sequencers and even audio signals to sync a few machines together, at a time when MIDI was not there. I worked with an engineer at that time called Michael Geiss, and we were able to build a kind of sequencer – the Matrisequencer – which had a matrix board enabling up to 100 notes to be programmed. [The 1978 version of this featured the ability to allocate notes to right/centre/left in slapback fashion, and add harmony by playing notes from the previous chord into the next one, through the time delay. In 1988 it features MIDI and SMPTE interfaces, and has developed into a



The Cage). This was an eight-track production, recorded in Jarre's own studio with sounds primarily provided by an AKS and VCS3, but with the addition of an ARP 2600, Eminent String Ensemble, RMI Keyboard Computer and a Farfisa Organ where appropriate. Two years later, with *Equinoxe*, the sound quality had improved, and increasingly prominent was a Geiss Matrisequencer, an updated version of which he still uses today. The Fairlight arrived in 1981 just in time for *Magnetic Fields* – which subsequently earned him the honour of being the first Western musician to have his music broadcast on Chinese radio. During October of the same year he made his epic trip to perform in Peking and Shanghai, culminating in the release of *The Concerts In China* in May '82.



sophisticated performance instrument.

“Transposing and adapting the sequence in any way was easy, which is better than sequencers which are programmed from the keyboard, whereby your hands make some clichéd chord pattern. You have almost no computer sequencers allowing you to transpose and play all of the sequence in real time. In front of a computer screen you are not involved in the same way physically – your mind is involved more than your body, and that’s the reason computer systems are the dark age of music technology. I think our children will laugh at this, because to make music at the moment you are still having to type characters on a keyboard. The fact that you can’t do actually much more than one event at a time or change one parameter at a time is not

progress. It is a necessary stage, but I think the next step will be to put hands-on control back in. In the future I will be looking for a sequencer that can be played in real time and transposed in real time, so that you can change several parameters at once.”

Jarre seems dissatisfied with most areas of technology, including digital recording and sampling, despite being seen by many as a technical innovator. The problem is one of limitations, although not, as you might expect, having too many of them. How can this be?

“I have this funny feeling at the moment, through talking to various musicians, that they are partly paralysed by the fact that for the first time we have less and less limitations”, Jarre explains. “For each project I do I choose what



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► instruments I'm going to work with, and try not to be trapped by technology and by the huge variety of instruments and sounds you can have. I try to keep a feeling of limits - these days a lot of manufacturers say having no limits is an advantage, but I would disagree."

For the recording process itself, Jarre remains a big fan of analogue technology, despite a previous digital flirtation on *Rendezvous*. His own studio once boasted an Otari 32-track digital machine, but this has been replaced by a Studer analogue machine with Dolby SR noise reduction.

"It's so musical", he comments. "It is much warmer, which is particularly important for synthesisers. With acoustic instruments you can get fantastic results on digital tape, but with all the new digital synthesisers, the sounds are being cut into very thin slices. When it goes into some processing machines, like digital reverb, it reslices the sounds in a different way. And then you go to the digital tape machine, and again it slices once more. It's like whether you prefer to live with the girl cut in thin slices or the girl with make-up - I think it is better to live with the girl even with heavy make-up, than the girl cut in thin slices. With the Studer the sound dynamics are better, the noise ratio is better - everything is better."

JARRE'S ZOOLOOK WAS a milestone for his music in that it was primarily an album of voices sampled on the Fairlight, and remains the composer's most innovative work to date. It involved a lot of things he had been studying, like the ethnic music he studied at the Musique Concrète centre in Paris, and combining these with the art of sampling, which at that time was still a comparatively new concept. Now, however, Jarre is tired of sampling for its own sake, and is returning to more conventional synthesis.

"In the beginning, sampling was fascinating because it was possible to use natural sounds in a

different way. But the big trap with sampling sounds is that everything sounds so realistic, and so it has to be handled with a lot of care. What used to fascinate me with electronic music was that the sounds made by synthesisers were like the difference between cinema and real life - you can build your own sounds to create moods and to convey emotions and feelings. The communication with the audience is totally different, because you are using language and sounds that do not exist in your day-to-day environment - with samplers it was taking your day-to-day sound environment and making music with it. Suddenly in all the records and all the music everywhere you have sampled sounds. *Rendezvous* was a reaction against that - now I am not going to use samplers just for fun, more for specific uses."

Not all aspects of new technology are necessarily disadvantageous, however. What Jarre finds fascinating, and the direction he is currently taking, is the integration of sound, light and colour. To do this he is using and developing new instruments such as the laser harp, the first prototype of which was made in 1979 by Bernard Sajner.

"I'm more and more interested in getting instruments with which you can actually have actions via lighting effects as well as audio effects - real audio-visual instruments. What is fascinating about the laser harp is that it enables you to play music with light and also get, keep and recreate the physical attitude and the physical feel of acoustic instruments." On stage, Jarre also uses two other remote controllers.

"The remote keyboard was actually a transformation of the Yamaha KX5, but customised for my own needs - the visual, and the ability to send program change data to the Fairlight and the Emulator. The other one - the big round one - was actually a prototype of what I'm developing now. It's a kind of audio visual instrument that can interface between the musician, synthesisers and lighting effects. In ►

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▶ other words, when you are pressing keys you are not actually playing music like on a chromatic keyboard, but you can actually switch on musical effects and synchronise them with the lighting. At each key you have a MIDI signal, along with other digital and analogue signals, to control other things."

Jarre is currently collaborating with a French company, Lag, on two new instruments for the *Destination Docklands* concert, but was reluctant to divulge any further details.

Along with Peter Gabriel, Jarre was one of the first Fairlight owners, and he has followed the company's philosophy ever since. He will derive musical inspiration from watching a film, from the sound of a Docklands crane, or even the conversation in the back seat of a car . . .

"When you go into the studio you are going in with all that you have experienced and that gives you a different approach to the keyboard every day. I like to change the way I work, change the chair or the light or change the instruments, always to get a new approach."

He continues, on a studio theme, "Sometimes I like to use noise gates to key sounds and sequences, to transform a sound through a noise gate by keying the gate to the sequencer or a drum machine. This gives a human touch to a sequence because of the shape of the envelope of the noise gate. Also, there are analogue processes you can use which are impossible with digital systems, like reversing tapes or slowing them down."

For the concert in September Jarre is promising new music and new approaches.

"In terms of music", he predicts, "the next step will be to get rid of all cables and have proper remote controllers. At the moment I am very interested in the music of the Aborigines and Pygmies - the polyphony of vocals where each singer is doing one note, and then achieving polyphony through grouping together. What I am doing currently is working very simply with two or three tracks, without any reverb and leaving all of that for the mix. That is a different approach for me, but if it doesn't work with two or three tracks I try something else."

We have only briefly touched upon the *Destination Docklands* concert itself. But as this is the main reason for Jarre's visit to London it would seem appropriate to delve further.

"What is so exciting on stage for me is the fact that I am going to conduct music and lighting and the visuals, and this is changing the whole thing in your mind. It means that you can actually deal on two different levels.

"What is also interesting is that you arrive at a location and for one night you change it entirely until the following morning when you disappear. There is a magical quality to such a one-off event. Also, the audience know that if they are not there they will miss it forever - and it's the same for the technicians and musicians. It creates a very special tension which is difficult to handle, but so very positive to go through."

Jarre will be accompanied on stage by a 120-strong choir, a bass player and guitarist (who are new to the line-up), a drummer, percussionist (classical and ethnic), three keyboard players, a soprano singer, a Japanese trumpeter, and string and horn sections. One problem of staging such an event is the transmission of the sound in sync with the light over a large radius. To overcome this, there has been a link-up with the BBC, so that the stereo FM Radio 1 signal, which will

carry the concert around the country, will also be picked up directly by the PA stacks. This solves the problem of trailing wires, and as it coincides with Radio 1's 21st anniversary, it will generate some nice publicity . . .

AS WE PASS Buckingham Palace the conversation moves on to the all-important subject of equipment.

"I'll be using various keyboards, because I don't like one kind of instrument. I mean, synthesisers are like acoustic instruments - in an orchestra you have violins with the cellos . . . And it's the same with synthesisers - the sound of a Roland D50, which I like very much, is totally different from a sampler or from analogue instruments and I think they are all complimentary. So, I'm going to use some Yamaha instruments - maybe the new MIDI piano, and also some Roland D50s or the D550 rack version. I like the Akai MPC60 - I use it in favour of a Macintosh for sequencing and so on, and I'm using one for the next LP and for this project. It's a brilliant machine and very musical. In terms of rhythm, I like the Dynacord ADDone - the MPC60 and ADDone take care of all of the drum sounds along with a Simmons SDX. I also have a Fairlight II and III and the Emulator II. I like some of the old English instruments very much like the OSCar, so I have two Oscars MIDI'd together. I'm in contact with the guy who designed it, and he has the prototype of a polyphonic OSCar, with a computer and 16 voices; he has a remote control for programming it, linked to a computer."

SMPTE code is used to synchronise the video, lights, fireworks, projectors, lasers, film and music. Quite an impressive list, but what are the limitations?

"There are a few", concedes the musician. "My wish would be total automation for the show - not to be robotised, but to get ultimate precision on stage. Exact sync with what is going on 800 metres from the stage is a problem, and was expensive to overcome. The main problem, though, is to get equipment which can be automated. If you are dealing with big, heavy projectors you have to manufacture engines to synchronise the whole system."

The main problem with talking about the concert seems to be Jarre's inability to find words to sum it up. "The whole idea is to try and put the ultimate diversity into this kind of experience", he says. "It's like an adventure to me. I mean, suddenly it's not a concert or a tour, it's much more than that."

"I have the feeling that I am still starting, and that I have not done so many things. The concept of Houston, or what I have done in China or Lyon for example, is really almost a demo of what I have in mind, in terms of the visual link with music. The spectacular aspect of it is interesting, but it's not my only concern. Obviously the media are conveying this image of the biggest show on earth, but I hate all of that. I'm not doing this concert, working day and night just to break a record, it's much more than that to me."

By now the car has arrived at the City Airport in the centre of the Docklands, and the scene of the concert itself. It's hard to imagine how this desolate area of East London will be transformed on September 24th. It's harder still to appreciate the magnitude of the event. I, for one, am going for a front row ticket. ■

"The sounds made by synthesisers are like the difference between cinema and real life - you can build your own sounds to convey emotions and feelings."

E-MU SYSTEMS

EMULATOR III

VERSION 1.21

Digital Sound Production Workstation

The long awaited follow-up to E-mu's popular Emulator II ups the ante to 16-bit stereo sampling and places it in a price and features class of its own.

Review by
Chris Meyer.

INTO TESTING THE new Emulator III, I have a few problems and complaints. I call two people at E-mu, and both ask, "What version software do you have? Aw, you should have the new stuff". One Federal Express package later, and I find almost all my problems solved and a dozen features added. Point - E-mu intend to keep this machine growing. Result: this review is going to be a snapshot of it circa late June, 1988.

But that shouldn't devalue this review. Why? Because reviewing the EIII isn't like reviewing just another synth or yet another 12-bit sampler. For one, thing it sits in a price category of its own - twice or more that of the 16-bit machines announced by Sequential, Akai, and Dynacord, half or less that of the AudioFrame, Fairlight, and Synclavier. For another, it's so comprehensive (we'll run down the specs in a bit) that spec wars are meaningless. It comes down to whether or not you need all (or a significant part) of what the EIII offers, and how painlessly it fits your way of working.

The Hardware

THE EMULATOR III is a 16-voice "stereo", 16-bit linear sampling instrument with sample rates of 33.3kHz and 44.1kHz, 4 Megabytes of RAM standard (expandable to twice that), and an internal 40 Megabyte hard disk. Of course, there's a 3.5" floppy drive, but you'll be ignoring it most of the time (internal hard disk, and a standard memory-full takes six floppies to back up).

Each voice has its own analogue filter and amplifier, and panning. There are 16 individual audio outputs along with stereo mix outs (the individuals take their related voice(s) out of the stereo mix). Other holes in the back panel include MIDI In, Out, and Thru, SMPTE/clocking in and out, stereo sample inputs, an RS232 and SCSI disk ports (the latter allowing external hard disks to be added - E-mu give a list of nine that already work, and are making their own 300Meg rack-mountable one), a metronome output, and two footswitch and one footpedal inputs (hardware supplied). Also in evidence are a pair of trigger inputs that accept a wide range of signals (from pads to audio), with a nice set of software trims to prevent double triggering and the like. But why only two? That makes the EIII pretty expensive as a drum slave; you'd want more for either an electronic drum kit or replacing all your drum sounds on tape.

The keyboard version (there's a rack unit available too) also has a five-octave plastic keyboard with velocity, aftertouch, and mildly clunky feel along with a pair of assignable wheels. There's a fan built into both versions to keep things cool - between that and the hard disk, the EIII isn't exactly a silent piece of kit (not bad; just not silent). As a result I'm told E-mu are switching to a quieter hard disk.

The user interface consists of a 4x20-character backlit LCD, a 10-key pad, four cursor controls (that occasionally

double up for other functions), inc/dec buttons that double up for yes/no responses, a data entry slider (curiously placed away from the keypad, as opposed to next to it, where the master volume and sample input level faders are), a number of dedicated buttons for the sequencer transport control and things like common disk functions, and a button per editing module. Spartan, but it works. The buttons have a good, solid feel, but the Enter button on my machine was prone to double-clicking. LEDs prompt where appropriate.

Communing with the Machine

E-MU'S SAMPLERS TEND to be designed on a modular basis with a number of submodules (and occasionally, subsubmodules) inside each module. Graphically, the EIII presents the module approach better than any previous E-mu unit. Having the operating system on the hard disk has all but eliminated delays in switching modules. Unfortunately, I still hate using it because the modules won't let me stay in any one place. You hit a module button, it asks you for a submodule. You scroll through the choices and hit Enter (or hit the number directly), and there you are. As soon as you're done with a subfunction, you get thrown out of the module - no chance to stick around and fiddle with it if you don't like what you've done. The worst example is during sampling - if your sample clips, the EIII sits there and tells you so, but won't let you resample until you leave the sampling module and go back in.

The EIII is not consistent from module to module (or submodule to submodule) as to how everything works. Sometimes the keypad can be used to enter numbers directly, sometimes not. It also likes to switch between Enter and Yes for acknowledgement of commands. You can't gracefully abort a function if you make a mistake, or the Enter button double-clicks - you have either to say No at the last step (harrowing), or go to another module and come back again. There's a wonderful Undo option every time you alter a sample, but it's in its own submodule - you can't stay within a submodule and try again.

Positively, the EIII has defaults (most of them even sensible), which can save you time and trouble (for example, it will automap samples upon sampling, if you wish). Undoing is invaluable - no more hesitation or remembering to make a backup before hitting Enter in the Mutilate module (it saves a copy of the original on the hard disk). A lot of functions are trimmable (such as zero crossing detector sensitivity). Working in stereo takes no additional thought on the part of the user. Numbers tend to be displayed in both time and number of individual samples (envelopes in time; LFOs in terms of frequency). Also, the EIII tells you what you're working on (which sample), even if it forces you to go to another module to change it.

Whereas most sampler manufacturers base things such
MUSIC TECHNOLOGY AUGUST 1988



Photography Rose Rounseville

as analogue treatments around individual samples, E-mu base them around "zones". Once you've spread a collection of samples across the keyboard (in one of two layers), you now change envelope shapes, filter cutoffs and so on, by ranges of keys with no attention to what portions of what samples you're taking in. Once you get used to this you can afford to forget exactly where samples are placed (the display tells you their names, anyway). Copying a keyboard zone into another preset (or even another bank) also automatically drags all the samples that make it up along with it - another of the many places the EIII manages to keep bookkeeping away from the user.

Modules

THERE'S NO WAY to detail every function of the EIII here - even the manual doesn't do a very good job of it, but here are some of the more interesting points I encountered.

You can set up a template of parameters for new samples: mono or stereo, sample rate, number of keys to automap it over, whether or not to normalise the gain and automatically trim the ends. From there, you can sample away without trouble. The EIII is one of those samplers that actually grabs a little bit of sound before the sampling threshold is crossed; if you set the sensitivity on the zero crossing detector really high, it gets the perfect balance of not leaving any silence on the front of samples while not chopping off any of the attack. Autotrimming the end of a sample is less successful; even at full sensitivity, some sound gets lost (I was told the hardware in my machine may have been slightly out, thereby fooling the detector).

There are all sorts of interesting looping tools - single stepping, zero crossing detectors, autocorrelation, and crossfade looping. While autocorrelation is a great idea in theory, I've yet to see it working better than zero crossing detection. In the EIII, autocorrelation gave slightly improved results on its own zero crossing points. In all digital editing functions, the pitch-bend wheel can be used like a video shuttle control to move back and forth through the sound to locate a point. Loop points can be changed while a key is held down, which makes life easier. Crossfading may be linear or equal power, with adjustable length. The forwards equal power crossfade is as smooth as any I've heard; the backwards/forwards left glitches worse than the original (back to the Undo function . . .). Stereo samples crossfade just as well as mono samples; they just

took longer (it's harder to get a straight loop out of them, because either side can glitch).

Truncation is as you would expect. There's a healthy collection of cut/copy/paste features, which saves sample fragments to an internal clipboard. Gain change can be performed over selected portions of the sound, and can be faded in or out with four different fade curves - unfortunately, it didn't sound quite smooth to my ears. There's also a Taper function for just smoothing the starts and ends of sounds.

Once I got into the specialised digital processing routines, I almost never got out. The subfunction I first thought most superfluous - digital sample rate conversion - ended up being the most useful. One, you really can salvage memory by lowering the effective sample rate after the fact (warning: loop afterwards). I also found myself artificially converting sounds to a *higher* sample rate, which made them sound less lumpy when transposed downward. Using the sample rate calculator built in, the sample rate can be optimised to make perfect loop boundaries fall on actual sample boundaries. A variation on sample rate conversion allows you to change the pitch of sounds, to make it easier to mix them with others that were originally sampled at a different pitch (unfortunately, this function doesn't keep the length of the sound the same, so you can't make one sample stretch all across the keyboard

Modules: *"If your sample clips, the EIII sits there and tells you so, but won't let you resample until you leave the sampling module and go back in."*

without munchkinisation). All of these functions take time (typically minutes) to perform, but made me realise I was really missing them before they existed.

There are submodules to superimpose DDL and autopanning effects onto samples that both work very cleanly. I had a ball taking a mono sample, copying it to make it stereo, tapering the two sides to silence at different rates, autopanning the two sides against each other (for a twirling pattern), and then running them through the DDL. Complaints? The DDL has restricted mix/feedback amounts (just numbers that were easy on the processor, instead of the "anything you want" philosophy of the rest of the machine), and I wondered where the Emax's DSP functions (convolution, additive synthesis) had gone.

Analogue processing includes three envelopes: one ►

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THE TECHNOLOGY THAT PERFORMS

► VCA, one VCF, and one wildcard that can go to pitch, panning, LFO rate, or LFO depth to pitch, volume, filter, or panning (more Brownie points). All envelopes are of the ADHSR (decade-old synth envelope plus a useful-for-samplers hold stage) - I've become used to multistage envelopes but these are adequate. The envelopes also have a one-shot mode (they skip decay and sustain) for percussive sounds and playing. The filter envelope can be inverted, and as you would expect, the filter has adjustable Q, cutoff, and keyboard tracking.

Not so good is the fact that there's only one LFO per voice, but it does have four shapes, a wide frequency range, a delay, separate depths for pitch, volume, filter, and panning, and "variation": it can vary in pitch per keystroke (a little humanisation). I couldn't find a way to sync the LFOs to keystrokes or each other. LFOs can be delayed, but don't fade in. Velocity can be routed ten different ways, all with their own amounts (nice for tweaking effects in), including such exotica as pitch, pan, filter Q, and sample start point.

As on the Emulator II and Emax, samples can be given a range of voices (and therefore individual outputs) to use. Since the EIII performs some of its processing in analogue form, it can't premix multiple voices to one output jack like all-digital units (Roland S550, Yamaha TX16W and so on).

As mentioned earlier, two layers of samples can be defined. These can be stacked (with delay and detune), crossfaded by position, velocity, or real-time controller (pressure), or switched between by velocity (with adjustable threshold) or external switch. I was disappointed that samples on the same layer couldn't be positionally crossfaded - you have to chequerboard them and set up a number of small crossfades alternately between the primary and secondary layers. Up to eight presets can be stacked. In general, the preset module (and the MIDI that drives it) seems to be really well thought out.

Remembering Notes

THE EIII HAS a rudimentary algorithmic composition device built in that's particularly well suited for new age music (it has a comprehensive arpeggiator). That's not E-mu's sell-line, it's mine. It's obvious what E-mu have done is taken the arpeggiator in the Emax and slapped it into this beast too. Some people look down on arpeggiators these days; I've no complaints.

Next to why bother with an arpeggiator, one of the most common questions is why build a sequencer into an instrument any more. Everybody has their favourite outboard hardware or software sequencer, and they tend to have more features anyway... The reasons aren't much different from including sample editing features, despite the widespread availability of external sample editing packages - it's nice to be able to do something simple quickly on the machine. I like the concept of a scratchpad sequencer that I can later download the contents of to a more "serious" compositional sequencer; others prefer having a sequencer built in for live performance rather than hauling a computer around. And some just prefer having everything in one box. Neither the arpeggiator nor the sequencer added much to the cost (except for the SMPTE) so it's a matter of opinion whether the software development time could have been better spent.

By the way, the EIII's sequencer is no slouch. It's at least as competent as any hardware sequencer you can find, with SMPTE, MIDI Time Code, decent resolution (96ppqn), volume levels per track, cut, copy, and paste, step-time entry and editing, advanced autocorrection and the ability to view and edit events in terms of SMPTE timecode or

bars, beats, and clocks. It does have some shortcomings - only 16 tracks, no time slipping or rotation functions, and to drive an external device it forces you to create an empty preset and assign that the outside MIDI channel. Overall, if you want to use a dedicated sequencer, you really won't be hurting here.

The Sound

THIS IS THE first sampler I've ever used in which the sound that came out was almost exactly the same as the sound that went in. It scared me.

What can be said? It's clean 16-bit sound. There's a lot of dynamic range, and the signal's quiet. Sounds hold up under transposition at least as well as any other sampler I've used - it handles downward transposition well and I couldn't detect any sidebands with any transposition. There was a low-level buzz that appeared whenever I was

Sound: *"This is the first sampler I've ever used in which the sound that came out was almost exactly the same as the sound that went in. It scared me."*

in a digital editing module (it seems to come from the pitch/scrub wheel looping on one sample while waiting to move), but playback was pretty clean. And I like having real VCAs and YCFs around - I'm sure they distort more than their digital brethren but they make the instrument more musical to my ears.

Verdict

I KEEP MAKING a comparison in my head between the EIII and a Fairlight Series IIX. This is because secondhand Series II's are starting to cost less than a new EIII (from a list price over twice that), and I'm remembering how many bands, studios, and producers bought one. The Fairlight was loved because it was so powerful, and so integrated - multitimbral, sampling, sample editing, a couple of sequencers (including the much-loved Page R), friendly user interface, SMPTE, and MIDI. I hit a mental block when I try to think of the EIII as such a star-maker, but in reality, it beats the Series II in almost every category: it sounds far better (and is stereo to boot), it has more advanced sample editing, more voices than the basic Series II, and is also multitimbral. The EIII only loses out in terms of its user interface - a four-line LCD and some cursor buttons is no match for a CRT and light-pen.

I could moan about a few small features I'd like to see on the EIII, but the fact of the matter is that this machine is about as full-featured and sonically clean as you're going to get for less than the price of a house. And the EIII is isolated from its competition in terms of its price and features (it doesn't out-feature any more expensive system; no cheaper system out-features it).

I personally found the EIII to be a lot more refined and thorough than I expected; I also found it to be a bit more cumbersome to use. But it sounds great. Perhaps it's best suited to the artist or studio who wants one instrument (and no interfacing hassles); who wants to, and can, devote the time to sampling and perfecting those samples; who would like (at the least) a sketchpad available to compose them into a song; and who requires CD quality. For that it's the best buy in town. ■

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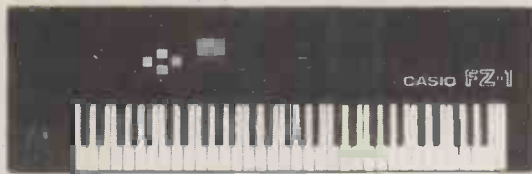
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RECORD ATTENDANCE

At last year's APRS show the buzzword was "digital"; this year there were almost as many buzzwords as there were visitors – and this year's was the biggest show to date.

Report by Simon Trask.

ANOTHER YEAR, ANOTHER show. It's a couple of years now since the APRS show moved to Olympia Two, a venue it fits into very comfortably. There was plenty to see at this year's show, and as usual not enough time in which to see it. Take it from me, showtime is no joke for us beleaguered hacks, who have to socialise (spend hours in the exhibitors bar) and find out what's really going on.

The late '80s is proving to be a testing time for the recording industry. While keeping up with the rapid developments in state-of-the-art digital recording entails an ever-increasing level of financial investment, developments at the lower end of the recording market are allowing more and more musicians to do much of their recording work away from the professional studio.

The march of the mega disk-based digital recording and editing systems continues apace. Two of many are **Digital Audio Research's** Soundstation II (£50,000 – £75,000) and **WaveFrame's** AudioFrame (£29,000-58,000).

The Soundstation II is a four-track (soon to be eight-track) digital recording system which can record on up to four 380Mb Winchester hard disks and up to three 740Mb removable optical disks. Each Winchester provides 60 track minutes of recording time at 16-bit 44.1kHz, so that the Soundstation is quite capable of coping with anything from television programs to Compact Disc masters to feature-length films to your auntie's triple boxed-set concept album.

The Soundstation uses a touch-sensitive plasma display for quick operation, adopting a scrolling-tape display format into which you can splice labelled segments of any length. Cross-fading, reel-rocking, time-slipping and splice adjustment provide a fine degree of edit control. In fact, the ease with which you can move segments around using DAR's touch screen makes tape splicing look positively primitive.

The idea behind WaveFrame's AudioFrame is to implement all aspects of music production digitally within a single "black box" – the archetypal digital audio workstation. Thus you'll find mixing, MIDI

sequencing, sampling synthesis, sound effects and dialogue editing, all implemented in the digital domain. The AudioFrame works under Microsoft Windows and interfaces with the outside world via MIDI Time Code, SMPTE, AES digital transfer and IBM's Token Ring Network. With the maximum memory of 30Mb the AudioFrame can record at 44.1kHz for over six minutes.

An interesting feature of the AudioFrame is its use of fixed-rate as opposed to variable-rate sampling. The latter is the traditional approach to sample playback, whereby samples are played back at quicker or slower rates to produce different pitches from a single sample. This approach requires tracking filters (to prevent aliasing) and variable-rate D/A converters, with each output voice requiring a dedicated set of output components. Fixed-rate sampling does away with aliasing and digital noise and the multiple components. Essentially, the AudioFrame uses curve-fitting algorithms to interpolate 512 samples between each pair of sampled points – providing an effective playback rate of 23MHz for a 44.1kHz sample rate. Expect to see fixed-rate sampling take over from variable-rate in the scheme of things (Roland are apparently already using their own version of it).

Another feature which we can expect to see increasingly on digital recording systems is time compression and expansion – altering the length of a sample without changing its pitch.

At the APRS, Soundstation II convincingly demonstrated the practicality of time variation with a +/-50% time alteration on a dialogue sample which managed to retain the character of the voice. In fact, Soundstation's ability grew out of DAR's Wordfit automatic dialogue replacement and synchronisation system, but there are powerful implications for music-making in there.

Time-stretching will also be a feature of Akai's new professional 16-voice, 16-bit stereo sampler, the S1000 (though apparently not until after the first release software). The S1000 comes with 2Mb of memory (giving 11.85 seconds of stereo

sampling at 44.1kHz) upgradeable to 8Mb, and will have an SRP of £2899 including VAT. As well as phono and XLR stereo audio inputs the S1000 has stereo phono outs and eight dynamically-assignable individual phono outs, together with a mono effect send and stereo return. Akai have wisely included S900 sample disk compatibility, while using a major London studio to develop the S1000's own sample library. Definitely a sampler to watch out for at the professional end of the market.

Syndromic were showing the range of **Hybrid Arts** software and hardware, which is developing into a comprehensive music production system, with Hybrid-switch software allowing rapid switching between Hybrid programs.

Hybrid have now bought out Nilford Labs, the company responsible for producing the hardware for Hybrid's ADAP1 ST-based stereo digital recording system, giving them complete control over the development of their system.

ADAP1 is limited by the largest amount of internal memory available on the ST (4Mb), with mono sampling at 44.1kHz on a 4Mb ST providing approximately 41 seconds of sample time. ADAP2, which is scheduled for September release (£2699.95 including VAT), will turn the system into a direct-to-hard-disk recorder with built-in AES/EBU and SMPTE read/write interfaces. Stereo sampling at 44.1kHz on a 720Mb hard disk will provide approximately 48 minutes of sample time. Digital I/O makes ADAP2 a candidate for, among many other things, CD mastering and DAT editing.

Forthcoming from Hybrid Arts is the company's own range of 19" rack-mounting hard disk drives for the ST, the HDX77 64Mb drive (£1499.95 including VAT), the HDX99 88Mb drive (£1799.95 including VAT) and the HDX154 129Mb drive (£TBA). Not exactly cheap, but then they've apparently been designed to a very high specification suitable for professional use.

Star turn on **The Synthesizer Company** stand, to judge by the crowds surrounding it whenever I visited the stand, was the Lynex ST-based 16-bit stereo sampling system, which was debuted at MUSIC TECHNOLOGY AUGUST 1988

last year's BMF. The Lynex is now functioning in conjunction with System Exclusive's Iconix sequencer to give a powerful sequencing/sampling package.

Together with software from Passport, Intelligent Music and Dr T's, The Synthesizer Company were also debuting the Friendchip SRC AT SMPTE/MIDI device and the Axxess MIDI Mapper.

Put a computer-based digital recording system like ADAP and Lynex together with today's increasingly sophisticated MIDI instruments and sequencers, a Yamaha DMP7D all-digital mixer and a DAT machine for mastering and you've virtually turned the all-digital, professional-quality "budget" recording setup into a reality.

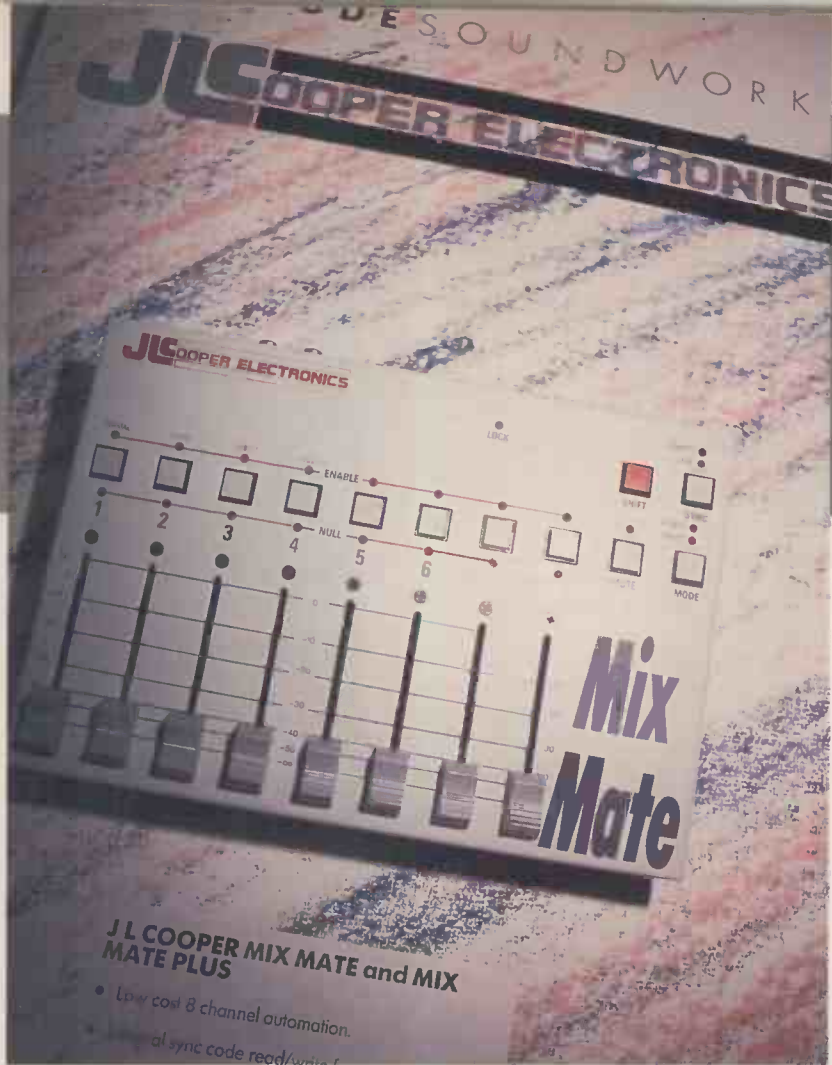
While DAT was a word that you scarcely dared whisper at last year's show, this year DAT recorders were out in the open, with recorders from several companies (notably Sony Broadcast) on demo. Perhaps not surprisingly, the industry is emphasising the professional applications of DAT as opposed to the troublesome "home" end of the market.

Sony were showing their pro models, the studio PCM2500 (£3250 excluding VAT) and portable PCM2000 (£3650 excluding VAT), both of which feature switchable 44.1kHz/48kHz sampling rate and AES/EBU digital I/O. In contrast, the Walkman-styled TCD-D10, which retails for around £1600, records at 48K and has no digital I/O. Both the portable machines have a modest battery life of two hours, while the PCM2000 uses one of the DAT format's auxiliary longitudinal tracks for recording and playback of SMPTE/EBU timecode. Interestingly, the DAT format includes the possibility of four-track recording (albeit at 32K with 12-bit non-linear resolution). But would a DAT portastudio be commercially viable at this stage in the game?

Sony were also showing their range of 60-, 90- and 120-minute DAT tapes, while tape distribution company Playback had tapes of 15, 30, 46, 60, 75, 90 and 120 minutes length.

Tascam debuted their own DA50 pro DAT recorder, while Casio's pocket-sized DAT recorder was on display on the London Synthesizer Company's stand (it is they, not Casio UK, who are importing it).

There can be no doubt that DAT tape will become an integral part of studio life at both the pro and semi-pro levels, and will filter through to the home studio in due course. Who's going to be the first



Photography Tim Goodyer

JL Cooper's MixMate is intended to bring automated mixing into the budget eight-track studio.

MT reader to submit their demotape on DAT?

Audio Design have clearly divined which direction the market is going in as far as digital mastering is concerned. The company have upgraded Sony's "domestic" DTC1000 DAT recorder for use in conjunction with their ever-expanding Sound Maestro Digital Recording and Editing system, which was originally designed to work in conjunction with Sony PCMF1 and 1630/1610 recorders. The DTC, renamed the ProDAT, can now sample at both 44.1kHz and 48kHz to enable the system to be used directly for CD mastering. Copy-defeat and EBU digital I/O enable authorised digital transfers of DAT data to be made.

The Fairlight CMI Series III, handled in the UK by Stirling Audio, has now reached software revision 5.4. New features include MIDI sync and song pointer with simultaneous SMPTE read/write, improved sequencer timing, mono hard disk recording, cue-list sequencing and sample monitoring at the sample rate. But still no CAPS sequencing software.

New Fairlight accessories include an 800Mb Optical Worm Disk (£4882 excluding VAT) with blank 800Mb optical disks (£180.17 excluding VAT), a weighted music keyboard (£1747.65 excluding VAT) and a CD sound effects library of 25 disks (£1225 excluding VAT). The entire Series III library fits on one side of one optical disk.

Meanwhile, over on the Harman stand that other giant system the Synclavier

was being demo'd both as an audio/video post-production tool and a sophisticated music recording and remixing tool. In the former case, it was demonstrated how the soundtracks to the famous village bombing scene of *Apocalypse Now* and the opening scene of *Aliens* were built up using the Synclavier, while the music demo saw a Stevie Wonder track being remixed on-the-spot. Also on show was the eight-track Direct-to-Disk recording and 256-track MIDI sequencing system, complete with new WIMP-style graphics front-end.

Yamaha were highlighting their DMP7 digital mixer, which was being demonstrated in a digital multitrack mixdown context in conjunction with Mitsubishi digital multitrack. The company were emphasising the new digital I/O capability of the mixer, with the AD808 eight-way analogue-to-digital converter, DA202 18-bit, eight-times oversampling digital-to-analogue converter, the PLSI Programmable Line Selector (8x4) and FMCI Format Converter - the latter allowing direct-to-digital mastering onto AES/EBU DAT machines from the DMP7.

Also in evidence was Steinberg's Mac and ST-based DMP7 editing software for controlling and automating 32-channel mixdown using four DMP7s, while the budget front was taken care of by the M100 digital multitracker, R100 digital reverb, SPX50D digital multi-effector and DEQ7 digital EQ.

Roland took the opportunity to show their new R880 Digital Reverb, which combines four separate and interactive

► reverb processors in one unit, and E660 Digital Parametric Equaliser (which can be two-channel/four-band or one-channel/eight-band). Employing a mix of 16- and 28-bit processing, these units also feature coaxial and optical digital I/O connectors. Also on show were the new M160 and M240 line mixers and the full line-up of Boss Micro Studio modules and a healthy range of Roland keyboard and sequencing products.

Korg, meanwhile, had a low-key presence at the show, with the SI Production Workstation and Q1 MIDI Workstation not yet available. Sound Technology were in evidence with C-Lab's powerful Notator sequencer/scorewriter package for the ST, Oberheim's new Matrix 1000 synth expander and the Alesis range of audio products.

Evenlode Soundworks have high hopes for a new automated mixing package debuted at APRS, **JL Cooper Electronics'** eight-channel MixMate. It's a compact box capable of storing fader movements and channel mutes in its internal memory, of locking to SMPTE while generating MIDI Time Code, and of synchronising tape deck and sequencer using the "smart FSK" code employed by Cooper's PPSI budget sync box while controlling the mix. All this for a VAT-inclusive price of £995. MixMate Plus allows an Atari ST or Macintosh to provide a graphic display, expanded memory and disk storage of mix data.

New software distribution company Audio Digital Technology were displaying a healthy range of IBM PC music software and hardware, including software from **Voyetra, MIDI Concepts, Magnetic Music and Twelve-tone Systems**, and hardware from Voyetra (MIDI interfaces), **DHCP, Music Quest** (patchbays) and **Real Time Logic** (the Event synchroniser). ADT are also carrying the MIDI Analyst, a 1U-high, 19" rack-mount box (£395) which provides analysis and filtering of MIDI data. Analysis is at three levels: interpreted, decimal and hexadecimal. The Analyst's stand-alone nature should make it ideal for inserting anywhere in a MIDI system in the studio or on stage. All in all it should be a valuable addition to the MIDI musician's world.

Shows usually throw up a few surprises if you look carefully enough, and at APRS Marquee Electronics were showing one of them, the **Eventide** digital H3000 Ultra-Harmonizer, which features Diatonic Pitch Shifting - in other words, it harmonises *in key*. One input can be harmonically pitch-shifted to up to two musical intervals (thirds and fifths, say). You can even customise your own scales, use just-intoned scales and set the H3000 to pitch-shift one note out of a scale for emphasis. On the evidence of a brief show demo, Eventide's latest harmoniser is impressive, evidencing no glitching and a quick response time.

Now, the clever dicks among you will point out that songs often modulate through different keys. Well, each H3000 patch allows you to specify the key that it will harmonise in, so all you need do is change patches (via MIDI from a



A major London studio is currently working on the sound library for Akai's S1000 sampler.

sequencer, if you wish). Ah, but could it handle be-bop chord changes?

The H3000 also has digital reverb, chorus, flanger, echo and EQ, together with possibly the most comprehensive MIDI control of a digital effects device yet, with virtually every parameter controllable via MIDI. The price of all this sophistication? £1650 excluding VAT.

I don't know about you, but I always like to seek out the "fringe" items at shows. This year, nestling in a quiet corner of the Second Level, the **National Sound Archive's** CEDAR project fitted the bill nicely. CEDAR (Computer Enhanced Digital Audio Restoration) is being developed in conjunction with the Engineering Department of Cambridge University as a system which will remove the thumps, scratches, crackles and hiss from old 78rpm records. The system is based around an IBM PC AT system, currently with eight-bit sampling and a processing rate of around 100 times the duration being cleaned up. The before/after transformation as evidenced on a demotape is very impressive. Obvious potential clients are the big record and broadcasting companies, but maybe in the long term this sort of technology will be generally available for cleaning up all our crackly old vinyl records to store the results on DAT, CD-ROM or whatever medium we'll be using by then.

Perhaps the biggest surprise of the show came from **Yamaha**, who took the opportunity to introduce a new computer called the CI. No, this isn't the beginning of MSX MkII. The CI is an IBM PC AT-compatible computer designed as a briefcase-styled portable, with a built-in 640x400-pixel LCD screen. Running under the Microsoft Windows graphics environment, the CI has 640K DOS memory and 512K RAM disk memory expandable to 2Mb (possibly 4Mb), two built-in 720K floppy disk drives, and co-processor capability. Another model with one built-in 720K floppy and a built-in 20Mb hard disk is being planned.

While the CI has the ability to run the massive range of IBM business software, Yamaha have also tailored their new computer to musical requirements, with

two mergeable MIDI Ins and eight MIDI Outs built in, together with SMPTE read/write capacity and two assignable control sliders.

If those MIDI Outs turn out to be individually addressable, that's 128 MIDI channels. No wonder Yamaha are working on a 999-track sequencer (what's more, with a 480 clock-per-quarter-note resolution). The CI may have the potential to run a complete professional MIDI studio, while its portability could make it the ideal computer for combined road and studio use (Yamaha will be providing a custom-designed flightcase for it, too).

The CI will come bundled with a Utilities disk containing MIDI monitor and SysEx bulk manager software, while other companies such as **Voyetra, Passport, Bacchus and Magnetic Music** are porting their software to take full advantage of the computer. Don't all rush out to your nearest music shop, though. The release date is set for October, and the provisional asking price is £1900 (including VAT).

Digital recording, digital editing, digital mixing, digital automation, digital interfacing... It's not difficult to see the way the recording industry's heading, whether we're talking high-end digital audio workstations or low-end (relatively speaking) composite digital systems. All that's needed now is for manufacturers of synths, samplers and the like to start fitting digital outputs to their instruments. Can it be so far off?

But where is the manufacturer's onward rush into digital leading us? And is it being met by a similar onward rush in the working methods of recording studios?

Digital recording has implications in the utilitarian sense of improving sound quality, and therefore of narrowing the quality gap between pro and home studios, but it also has creative implications which arise from the ease with which musical material can be manipulated in the digital domain.

So what stage will we be at by the next APRS? Stay tuned for next year's exciting episode.

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onboard 3.5" 793k byte disc drive. It'll sync with virtually anything, has its own SMPTE generator and will control any number of MIDI instruments via 2 MIDI INs and 4

MIDI OUTs. Its large 10 x 8 backlit LCD display keeps you well informed at all times, and if you're ever unsure of your next step, a touch of the Help button will bring you a screenful of advice in plain English.

And considering how it outperforms all the hardware in the photograph put together for roughly the same price, the ASQ-10 quite simply stands alone.



Exclusive Information

System Exclusive: powerful data dumping and loading system or industry communications fiasco? What can be achieved with and what are the limitations of SysEx? Text by Vic Lennard.



CIRCA 1975, MOST synths were monophonic and could only be patched together by jack to jack cables carrying pitch information – called CV, or control voltage, which tended to be a one-volt

change for a pitch shift of one octave – and note on/off – or gate – information. When polyphonic synths arrived on the scene the problem became even worse . . .

In 1981 the Universal Synthesiser

Interface appeared, courtesy of Sequential Circuits. This was incorporated on the Prophet 10, and replaced CV and Gate connections with a digital serial interface. By the end of '82 the US and Japanese manufacturers had collaborated to set up a standard called MIDI – the Musical Instrument Digital Interface, which most of us now take for granted.

Conventions

MIDI SPEC 1.0 was quite specific in most areas. The essential hardware was outlined, and all information was to consist of ten bits – a start bit, eight data bits and a stop bit. Travelling at a speed of 31.25 Kbits per sec, these ten bits take 320 microseconds to transmit.

These bits are collectively called a byte and the highest value bit (128 or 80H) is referred to as the Most Significant Bit (MSB). Two different types of byte were specified: Status, which identifies the kind of message and has the MSB set to 1, and Data, which carries the content of the message and has the MSB reset to 0. Consequently, all MIDI messages consist of a Status byte followed by 0, 1 or 2 data bytes unless they are related to System Exclusive (SysEx) messages. The specification is equally rigid on Channel and System messages, but with respect to System Exclusive, the original document, even after revision, called for the following basic format:

Status byte:	FO	:SysEx Start
Data bytes:	0-7F	:Manufacturer's ID
	0-7F	:
	:	Data
	0-7F	:
	F7	:End of Exclusive (EOX)

Photography Alan Beeson

The identification codes for manufacturers were set up and include 41H (Roland), 43H (Yamaha), 44H (Casio) 47H (Akai) and so on. The basic format still gives carte blanche to manufacturers to continue on their merry way and leave the non-technical musician completely lost and dependant on RAM cartridges/cards for data storage. These usually cost, and leave the technical musician working his way through the MIDI implementation pages at the back of the synth manual – if such pages exist and if they happen to be correct. ▶

► Practical SysEx

System exclusive messages allow you to transmit data to another like synth or to a third party machine such as a computer, and to receive data from a similar range of devices. Data may be in the form of individual parameter changes such as memory protect on/off, but tends to be that of voice data – single voice or bulk.

Due to these vague outlines, many different “standards” exist. In fact there are practically as many of these as manufacturers. Some synths can initiate bulk dump by pressing buttons on the front panel (Roland D50, Yamaha DX/TX7, FB01) while others have to be asked to supply their data by the receiving system. Some synths will allow SysEx information to merrily sail past the memory protection (Casio CZ101, which uses a hardware memory protect), and others will only permit data to be sent to a cartridge (Roland JX10). Then there is the point about whether data is sent in a continuous stream or broken down into blocks, and whether the entire internal memory is sent or split up into areas.

Another bone of contention is that of handshaking. In handshaking mode, acknowledgement commands are sent back every time a block of data is received. This means that an arithmetic code at the end of the data block (called the checksum) has been checked and that the data in the block is correct. MIDI In-to-Out and Out-to-In cables have to be used, which invariably necessitates the use of a MIDI junction box and a tangle of leads. In no-handshake, or one-way mode, data is transferred without acknowledgement of receipt allowing MIDI connections to be simpler but also permitting mistakes in the data to go unnoticed.

Let's consider an example of a current MIDI implementation: the Roland D110, multitimbral LA synthesis module. It uses the following format for data transfer:

```
FO      :SysEx
4I      :Roland ID
dd      :Device ID
I6      :Model ID for the D110
cc      :Command ID.
data    :
:       :Data in blocks of 256 bytes.
data    :
F7      :EOX
```

The device ID allows for more than one D110 to be used and can be set on the relevant modules. Out of interest, the format is the same for the MT32. The command ID's are as follows:

CODE	ID	NATURE (HEX)
RQI	11	Request data 1 way
DTI	12	Data set 1 way
WSD	40	Want to send data
RQD	41	Request data
DAT	42	Data set
ACK	43	Acknowledgement

EOD	45	End of data
ERR	4E	Communication error
RJC	4F	Rejection

A typical situation might be the need to save the voice which has just been edited, such as the one in the Tone temporary area, which, for instance, is the 3rd part of the 8 that the D110 can simultaneously play. The following conversation takes place, in handshaking mode, between the D110 and a computer.

```
1. Computer FO 4I 00 I6 4I 04 02
           EC 00 01 76 97 F7
2. D110     FO 4I 00 I6 42 04 02
           EC dd...dd cs F7
3. Computer FO 4I 00 I6 43 F7
4. D110     FO 4I 00 I6 42 04 03
           EC dd...dd cs F7
5. Computer FO 4I 00 I6 43 F7
6. D110     FO 4I 00 I6 45 F7
7. Computer FO 4I 00 I6 43 F7
```

Line 1 requests data, from the D110 with device ID 00, starting at address 0402EC and of length 000176 bytes (Hex). The hexadecimal checksum is 97 which, when added to the 6 previous bytes, provides for the least significant 7 bits to sum to zero. The D110 sends across the first 256 bytes and the computer acknowledges them, although it may not have actually checked the checksum. The D110 then sends across the remaining 118 bytes to a start address 256 bytes further on than before. “Thanks Y'all”, says the computer, “That's all folks”, signs off the D110, and a final “Be seein' ya” comes from the computer.

The addresses to which data can be sent, and the data lengths are obtained from the D110 manual. Even so, I can understand if you are totally perplexed, or at least confused. You're not alone. The main problem arises from the wording of MIDI specification 1.0: “Only the basic shell (for SysEx messages) is defined. Specific formats are designed and published by the manufacturer”. Great. So having sorted out a way to transfer specific data from a D110, different problems will arise with each different synth. Also there are a variety of differing procedures within any particular synth. The D110 can dump and load the temporary areas for Timbres, Tones and the Rhythm setup, the memory area for the 128 Timbres, 64 Patches and 64 user Tones as well as the system area which houses the reverb characteristics and the partial reserve for each part.

Computers and Software

First of all the bad news. Unless you have a computer such as an Atari ST, your ability to dump and load data will be limited. For instance, a Roland MC500 will be able to receive and send data as long as it is initiated from the front panel of the relevant synth in no-handshaking mode – sequencers of this ilk cannot send out request and acknowledgement commands.

As for the Atari ST, SysEx handling is starting to appear within the package of the sequencer. C-Lab's Creator will allow you to record data and edit it but, as with the MC500 problem, this is limited in scope. Steinberg's Pro24 III now has a single dump command line with 17 bytes available incorporated in the Dump Utility option, but very little can be realistically achieved with so few bytes – certainly nothing as involved as editing. Dr T's have a piece of software called Injector which sets itself up as a desktop accessory – an oddity when you consider that their sequencers are completely non-GEM orientated. Again, it only has the ability to work with ten preset synths and although others will be included in updates, it is hardly a creative SysEx tool.

This, then, brings me to the only professional software system exclusive editor on the market – Hybrid Arts' GenPatch (which I reviewed in MT, April '88).

GenPatch has 11 commands and will not undertake certain tasks, for instance checking checksums – it assumes that they are correct and treats them as bytes of data. The above D110 dump would be treated in the following manner:

```
1. Send sentence FO 4I 00 I6
                 4I 04 02 EC
                 00 01 76 97
                 F7
2. Loop 2 times
3. Receive sentence FO 4I 00 I6
                 42
4. Receive data 261 bytes
                 (includes
                 address,
                 checksum
                 and F7)
5. Send sentence FO 4I 00 I6
                 43 F7
6. End of loop
7. Receive sentence FO 4I 00 I6
                 45 F7
8. Send sentence FO 4I 00 I6
                 43 F7
```

As before, the address and data sizes for line one are obtained from the manual and everything else is far easier. GenPatch stores the data in the correct order and writes a header to send it back to the correct place when needed. Configurations are available for practically any synth and updates to these cost the price of a disk and postage.

Samplers

WITH THE ADVENT of the relatively cheap 12-bit sampler came the need for some degree of uniformity with regard to the dumping of sounds. Sequential initiated a format in their Prophet 2000 which was subsequently copied by Akai in their S900 – in fact, samples can be transferred directly between these two machines without the need for computer intervention.

The MIDI Sample Dump Standard was adopted in January 1986 after a series of proposals had been submitted to the

Japanese MIDI Standards Committee (JMISC) and the MIDI Manufacturers Association (MMA) in the USA. The basic idea is similar to that of a handshaking in a synthesiser – a request is sent, a header returns carrying relevant data, namely the bit format sample period, sample lengths and sustain loop points. The waveform then follows interspersed by acknowledgements. In greater detail this would read:

REQUEST

FO :SysEx
 7E :ID, Universal non-real time
 cc :MIDI Channel
 03 :Sub ID, Request
 ss ss :Sample No.
 F7 :EOX

HEADER

fo :Sysex
 7E :ID: Universal non-real time
 cc :Midi Channel
 01 :Sub ID: Header
 ss ss :Sample No.
 ee :Format: No. of bits
 ff ff ff :Sample Period
 = 1/sample frequency
 gg gg gg :Sample Length
 hh hh hh :Sustain Loop Start
 ii ii ii :Sustain Loop End
 jj :Loop Type
 F7 :EOX

DATA PACKET

FO :SysEx
 7E :ID: Universal non-real time
 cc :MIDI Channel
 02 :Sub ID: Data Packet
 kk :Packet No.
 dd...dd :120 bytes of data
 cs :Checksum
 F7 :EOX

Should any errors occur such as the checksums not tallying then a NAK (negative acknowledgement) would be sent, requesting that the last packet of data be re-sent.

Note that no programming details can be transmitted from one sampler to a different model using the Sample Dump Standard. There is a piece of software called GenWave/12 from Drumware (reviewed in MT, July '88) which allows interaction between all 12-bit samplers – check it out.

Conceivably, it should be possible to take a sample from an 8-bit sampler such as a Mirage or Emulator II, write a new header onto it and transmit it to a 12-bit sampler. Oh, and as far as I know, Fairlight Series IIIs are very secretive and do not have Sample Dump implemented. Finally slapped wrists time for Casio. Having signed an agreement to adhere to the Sample Dump Standard, out came the FZI which adheres to... Absolutely nothing. Who said the spirit of rock 'n' roll was dead? Instead there is a 118-page book entitled "Casio Digital Sampling Keyboard

FZI Data Structures" for anyone who fancies a challenge.

The Bottom Line

You've probably been thinking it; I'll say it – what a minefield. Although there are only two basic techniques of data transferral – namely handshaking and one-way – so many sub-techniques exist as to make life very awkward indeed. Certainly, those of you with dedicated sequencers up to and including the Yamaha QX3 and Roland MC500 are going to find this process nigh-on impossible unless you can dump data one-way from the front panel of your synth. The list of possibilities includes: **Yamaha:** DX7, TX7, DX21, DX27, DX100, FB01, TX81Z (single voice only) and TX802. **Roland:** D50, D550, D10, D20, D110.

Most other synths require handshaking. Check your user's manuals, we keep telling you they're useful, don't we? With a large synth setup it's worth investing in an Atari ST and relevant software just to dump and load data, given the cost of data saving media.

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Various Artists *Techno: The New Dance Sound of Detroit* 10 LP

I'm suffering from serious déjà vu here. Having just recovered from *House: The New Dance Sound of Chicago*, along comes this double album called *Techno: The New Dance Sound of Detroit*. Detroit, as you're probably aware, has only previously been famous for Motown records and car production. Techno music has most in common with the latter - hard soulless electronics, borrowing heavily from both European industrial pop and black American garage funk.

Comparisons with Chicago's finest are inevitable, although house has a broader base of historical influences than techno which is unashamedly modern. It's been suggested that it's free form jazz for the computer era, a series of complex sound experiments that often defy the logic of more uncomplicated dance genres.

On an equipment level, this album combines the best of old and new synth technology. Robotic analogue bass sequences are made more interesting by fluctuating frequency and resonance - something that's virtually impossible on new keyboards in these days of digital access. TR808 and 909 programs underpin the otherwise sparse instrumentation. Samplers make their presence felt, but more for rhythmic and percussion purposes than for complex textures.

You just can't do this record justice on a home stereo system, even if you crank the volume up to maximum. It can only be fully appreciated on the dancefloor in a night club environment, whereupon it becomes hypnotic and compelling - even entrancing.

While all the most important names are on this album, people like Juan Atkins, Kevin Saunderson and Derrick May, a possible weakness is the omission of some of the more classic tracks - 'Nude Photo', 'Strings' and 'Off To The Battle' for example. If you like Kraftwerk, Yello and other such European bands, and you have discovered yourself throwing shapes to acid house records, you will absolutely adore this. ■ Db

Phil Thornton *Forever Dream* Ocean Disques LP

Somewhere on the south coast of this fair island is a sanctuary for former members of the Bollock Brothers, which makes them go slightly strange in the grey-matter

department, and put out ambient instrumental albums such as this. *Forever Dream* is a live new age album recorded at the Findhorn Foundations Universal Hall, wherever that is, and features a Moog Source, DX7, Prophet 2000, D50, JX3P, Mirage, CZ1000, Didgeridoo - all high tech stuff, I'm sure you'll agree.

Thornton has now established himself as one of Britain's leading instrumental synthesists, having recorded several albums for various record companies around the world. As a member of Expandis he built up a reputation for live performance, and the lessons learnt with them have served him well here.

Forever Dream interweaves spontaneous improvisations with tightly programmed sequences to create a unique atmosphere. It is perhaps best suited to meditation (no, don't titter), although it's extremely listenable and relaxing in its own right. The sounds are as varied as the equipment list suggests, Thornton being supplemented with four other musicians on stage. 'Forever Dream Part 3' is also available on the *Ocean Collection* compilation album, which, if this is anything to go by, could prove a very worthwhile investment. ■ Db

S-Express Bomb the Bass Baby Ford Rhythm King 45s

'Mega Blast' and 'Superfly Guy', from *Bomb The Bass* and *S-Express* respectively, are arguably the most awaited follow-up singles since Frankie's 'Two Tribes'. The debuts from both bands took the themes of 'Pump Up The Volume', and pushed them further to create two of the most powerful dance records of the year. Now DJs Tim Simenon and Mark Moore have to prove that they were not flashes in the proverbial pan, and there's talent lurking within.

Consequently, gone are the sampled Rose Royce loops. Gone are Thunderbirds cuts. Gone, even, are the dubious Yamaha cuicas which underpinned the last *S-Express* choruses. So what have we got instead?

Simenon, in the BTB camp, offers us a ridiculously simple pair of bass/lead synth riffs, following the rather self-congratulatory "There have been mixes and dance tracks put together in the past, but none can out-run or equal the power of *Mega Blast*". The result is a record with all the immediacy of 'Beat Dis', and which takes the listener on a journey equally appealing, if less obviously structured. Truth is, I could have done this, you could have done this, even my mother could have done this. The difference is, none of us did,

but it will now be immensely successful regardless. It has the requisite quota of samples and, believe it or not, the B-side, 'Don't Make Me Wait', is a song with both lyrics and a tune.

'Superfly Guy' is the sort of record DJs fall in love with from the first eight bars. Less blatant in its, ahem, "inspiration" than 'Theme From *S-Express*', it sits on the more cred/less commercial side of the dancefloor fence. There are lots of sampled vocals, and a huge bass drum, the power of which is lost on yer average home stereo. 'Lollypop' and 'Funky Killer' on the flip side, see Mark Moore get into some serious acid house, narrowly avoiding becoming a self parody. They are dangerous enough to turn down if an elderly relative enters the room, but not obstructively so.

The same cannot be said for Baby Ford's 'Oochy Coochy'. This is unashamed acid at its most acidic. You'll probably hate this record on first hearing, but if you don't it could well become your Single of the Year. Synthesisers come and synthesisers go, sometimes in tune, more often out. At the end of it all nothing has really changed, but it won't get played on the radio. File under "very dodgy".

Each of Rhythm King's major successes so far have been with new artists, and 'Mega Blast' and 'Superfly Guy' are the first time they've had to live up to people's expectations. These are all records at the forefront of technology, and the record company must be given credit for having faith in innovation and being brave enough to market it. Long may they reign. ■ Db

Blue Mercedes *Love Is The Gun* MCA 45

Produced by Phil Harding and Ian Curnow, this is your average PWL get-down-boogie fodder, aimed primarily at the dance floor. The sound is crystal clear - all-digital synthesisers and Calrec microphones, and what's more, the song has a strong hook and singa-longa-chorus. Can't be bad. And then you get to the *Wap Bam Boogie* samples, which sound strangely like those on the recent Matt Bianco single. Have the boys in blue been rumbled? Or is this just one of those 'mazin rock 'n' roll coincidences'?

The truth is somewhere between the two. The *Blue Mercedes* track was actually finished long before Matt Bianco arrived in the charts, and both records have the legendary names of Harding/Curnow on the list of credits. In the spirit of investigative journalism, I rang PWL, and a few minutes later had Ian Curnow on the line. Apparently, in the wake of lawsuits,

including the legendary M/A/R/R/S vs Roadblock case, sampling from records has become a little bit taboo down at The Vineyard. Instead, Harding and Curnow have their own group of rappers, to whom they pay a session fee, and then sample them at will. The voice on both the records in question is

that of somebody called Ambassador, who came in one day, did his thing, and then went home again.

Neither Curnow nor the Blue Mercedes management think that Matt Bianco's success will be detrimental to 'Love Is The Gun' as DJs will be able to mix both records together -

ceaselessly. While it may seem strange that two records, by different bands, should sound so similar and be released at around the same time, it's unlikely that this will be the last time it will happen. Indeed, Curnow now has a library of David Titlow vocal samples - you ain't heard nothin' yet. ■ *Db*

demoT·A·K·E·S

I've never been to Grinah Stones - a natural stone formation in the Peak District, in case you're already lost - but they must be one hell of a groovy place if our first demo from **Petrus Saduikis** is anything to go by. This magnum opus is called *Sunrise Over Grinah Stones* and it consists of two completely different, nay, diametrically opposed sections... "As different", says Saduikis, "as night and day!" How appropriate then, since their full titles are 'Before Dawn' and 'After Dawn'.

The first section consists of short bursts of speech, music and noise, copped from shortwave radio and distorted by means of a home-built external beat frequency oscillator and then fed into the VCF of that ghost of a machine from the past, the Transcendent 2000. If they're really lucky, the resultant noises are then fed into an Ibanez DM1000 DDL before finally coming to rest on the tape inside a Fostex X15.

Surprisingly, rather than coming across as the load of old self-indulgent tosh which I expected, this chaos of disconnected sound weaves a potent and extremely eerie magic which really does manage to evoke something deep and mysterious. Certainly, if this is what to expect at Grinah Stones just before sunrise every day, I'd think twice about walking your dog up there.

But as the glorious golden orb peeps over the horizon (the sun for those that haven't seen it lately), the mood changes quite dramatically, as does the instrumentation and the method of composition. Out to play come the TX8Z and Poly 800 to join the DX7 each getting a MIDI cable up the jaxy from the 520ST-run Steinberg Pro24.

The score was, so we are told, originally intended for violin, cello, piano, marimba, organ and synthesiser, but Mr Saduikis has just stuck to appropriate presets on his synths and hoped that

nobody will notice the difference. This proves to be the undoing of the piece, since without the rich timbres of acoustic instruments to provide interest, the musical ideas just aren't strong or coherent enough to make any impact. I suspect also that much of the composition has been done in step time with a pretty low resolution which means that many of the sections feel rather stilted and clumsy. Again this would have been avoided with real musicians playing real instruments "from the heart". In certain places, Saduikis has tried to make a feature of this, through obviously mechanical and impossible-to-play polyrhythms, but because he's chosen rather gutless synth voices, to my ears it just sounds like a factory of demented musical watches going off at once.

The next envelope to be received from the dog's slavering jaws fell open to reveal a cassette containing material from not one, but two bands: **Violent on Vodka** and **These**. Wot, methought, is this some sort of socialist commie-bastard musicians' co-operative or just a set of mean Northern buggers trying to economise on tape and postage? (And before we have the whole of Nether Wallop writing in to dispute that last remark, let me say I'm a mean Northern bugger myself, so I know what I'm talking about).

Closer inspection reveals that common to both bands is the name Paul Foster, being the bass player of the first and the entire line-up of the second. As a solo artist Foster lists his influences as A Certain Ratio, Kraftwerk and "various latin and modern jazz artists" (don't be afraid to name names, Paul) and indeed the six tracks on side one all bear traces of this.

Instrumentation includes MC202, fretless bass, piano, Casio VL-tone and an unspecified Hohner electric piano/string synth and various drum

machines, including the trusty TR606, Boss DR110 and Korg DDM220.

Rhythm programming turns out to be Foster's real talent: 'Hit Me', 'Afrika' and 'I Scan' all feature superbly inventive percussion tracks which also happen to be extremely well-recorded - amazing considering all the machines are decidedly el-cheapo.

Less good is his work on the harmonic side, mainly because the timing is all to pot. On the first point, I can't help wondering why he doesn't use the MC202's sequencer more often as this would give the basslines a more solid feel and allow other instruments to "drift" slightly over the top without it being too apparent. Of course, what it won't cure is the tendency for all instruments to be out of tune with one another.

Turning over the tape to listen to **Violent on Vodka**, I get the impression though that, aside from drum machines, Foster works better with humans than robots. The line-up here is Nichola Hackett (vocals), Liam Harvey (guitars) and Andy Heyes (trumpet and trombone). **VOV** (nice name, by the way) play a cool blend of modern jazz influenced dance music. ■ *Nicholas Rowland*

Foster's beat box once again provides suitable backing, though I feel that the band would benefit from a real drummer, though no doubt the problem here is being able to find one who isn't too witless on whisky, moronic on Martini or senseless on schnapps.

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

liveT·A·K·E·S

NoWaMoWa

South Bank Purcell Room

The late '80s have not been a particularly joyous time for the likes of Phil Manzanera. Currently in his post-Roxy, post-popularity phase, he has withdrawn to a shelter within the new age umbrella, seeing fit to re-emerge under the banner of **NoWaMoWa**. This, for the unenlightened, comes "at the sharp end of the experimentation in sound and vision" - *Sonomontage* for short. What all that means, is that while the musicians play on stage, there is a simultaneous visual input from lighting

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technicians, including a twin-projector slide presentation. This, however, is not the new concept it's supposed to be, and as such is flawed but interesting.

The music at the recent Purcell Room concert was of the largely improvised instrumental type. Manzanera was backed by a percussionist, a bassist and a keyboard player on stage, with a four-strong team taking care of the visuals. But was it worth it?

The text on the back projected transparencies goes under the heading "very pretentious", the music under "slightly boring". While it was impossible to be unimpressed by the sheer power of the sound, this had more to do with the size of the amplifiers than the particular notes played. It was

one of those evenings. It only ever threatened to become interesting during the final track (before the obligatory encore). A huge "NoWaMoWa" vocal sample was set against some power chords and a tremendous riff that was a worthy climax to an otherwise unremarkable night.

Essentially, this gig only served to provide the anti-new age lobby with fresh ammunition. There was nothing particularly 'new' about NoWaMoWa, and although spectacular in its own right, the concert was strangely unimpressive.

A studio album of the music, called *The Wasted Land*, will be available from the beginning of October. I'm not going to hold my breath. ■ *Db*



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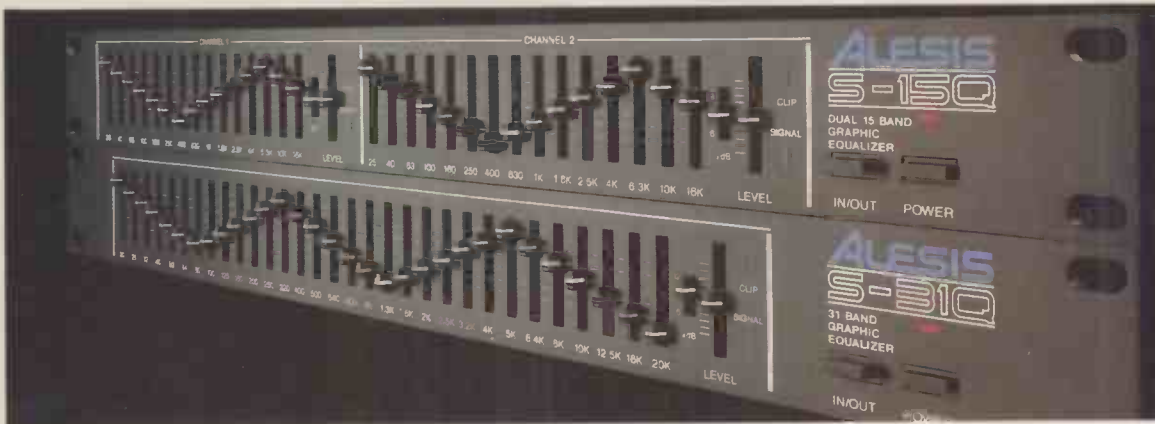
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BIG TROUBLES



If you've been wondering about the future of rock 'n' roll, wander no further - Ellis, Beggs & Howard believe they have the answer: they are the future.

*Interview by
Tim Goodyer.*

ELLIS, BEGGS & HOWARD, where do you start? Energetic? Yes. Good Looking? Most certainly. Categorisable? Not readily. Pretentious? Well, Simon Ellis did tell me that if he heard Rick Wakeman play a lick he couldn't, he'd go home and cry. Not exactly the sort of confession you'd expect to hear in 1988. Meanwhile Nick Beggs is laughing at the press that are still laughing at him for his time with Kajagoogoo, and playing the Stick (the Chapman variety). Austin Howard? Well he's into serious soul singing and pink 'n' black silk trousers.

Their musical tastes and ideas are as varied as their backgrounds. The debut single, 'Big Bubbles, No Troubles', is as smooth a piece of funk as ever filled a dancefloor but comes backed with 'Rock Me' which does just that with sampled-and-looped drum tracks. Are Ellis, Beggs & Howard just another rock band?

"I think that's what people want", comments Beggs, "because rock stands the test of time. It's the only phenomenon which is the real epitome of what popular music is all about. Rock music inspires people to a greater degree than reggae or funk. Rock music is more raw, people can relate to that energy. It's more stage-orientated

music. Being a live band is something that will perpetuate a band. And unless you play live you won't get much of a following, especially in America.

"You can either do it the Pet Shop Boys' way or the U2 way. I know which I'd rather do.

"I saw a thing on *Wired* recently about how Zeppelin had influenced a lot of people. They had John Paul Jones with The Mission on, and all these '70s-orientated bands. But I think it's going to go a stage further than that, I think we're going to see bands coming out sounding like Bad Company. I think that's where we're coming from: that sort of '70s rock and soul feel. Our soul is Austin, he's taken those influences from his earlier days and, in turn, we get inspired by them."

But the rock parallel isn't limited to the music itself - Ellis, Beggs & Howard also believe in proving themselves on the stage in the best tradition of '70s rock bands.

"It would have been the easiest thing in the world to go with a big video and the big record company hype for the single, and go straight to the top of the charts", Ellis explains. "But we said 'let's build a following first, let's earn ourselves a reputation. We didn't even have to

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play live if we didn't want to, but we thought it was so important to build up a following. The industry is so messed up, in this country anyway, that if you're not in the charts then you're not going to get the media coverage and all those snowballing things that make a band what it is. The alternative is to hang around for six years and release five albums and have no hits like U2 and Simple Minds. Basically we want to make people aware that there are other things in music coming along - like us. Something is going to happen to music soon - I don't think it'll be like punk, punk could never happen again - what I think will happen is that there will be bands like us."

"I feel it's the right time", agrees Beggs, "because I hate everything else that's going on. We're lucky really because we're sitting here at a time when a certain type of music has reached its zenith - in a way it's kind of a reaction. The positive thing about punk was that it happened when everything else drossy was around. I loved Yes and all those dinosaur bands that they were reacting against, but there was this very positive kinetic energy that went off in all sorts of different directions. Malcolm McLaren was like the godfather of punk in England and he's the guy who started off scratch music in England as well. He's one of those people who has an insight."

"People have called us the new Rolling Stones", continues Ellis, "not because we sound like them but because of the attitude."

The drum tracks that form the foundation of 'Rock Me' were lifted from Schoolly D and James Brown - not so much a rock approach as hip hop.

"It doesn't sound anything like house or hip hop", counters Beggs. "It's just a hard sound - and live it's even harder. We wrote that song on stage during a soundcheck at the Heaven gig we did. Then we did it during the set as a jam. Then it ended up as a B-side. But that's where the band's coming from, that sort of spontaneity. A lot of the songs are written like that."

"It's the heaviest drum beat I've ever heard in my life", comments the keyboard player. "It's a four-bar Schoolly D pattern and a two-bar James Brown shuffle that came from a studio in South London. They'd got them on disk but they weren't refined so I had to mess with the loops right until it was happening. I'm sure I'm going to get in trouble for it one day, but it's such a wicked drum beat . . ."

"I can't understand why rap and house music have gone on as long as they have so successfully", continues Beggs. "I can't understand why people can watch rap artists doing what they do and not feel embarrassed about it. Watching the Mandela gig I just wanted to turn the rap section off because I felt so embarrassed by the whole thing."

"The guys have done it - they've all proved what men they are through rapping - so now the women are doing it. You've got Salt 'n' Pepa going 'Hey, I'm real cool, I've got great breasts'. It's a load of rubbish. It's like someone taking a formula and working it until everyone's pissed off with it. It was a great idea to start with but these ideas have been perpetuated much longer than they deserve."

"Rap artists say that it's really tough music", interrupts Ellis, "but I've been to some shows where the drum beats are the tinniest, tackiest drum beats I've ever heard in my life. If they're going to do it they should at least get a massive
MUSIC TECHNOLOGY AUGUST 1988

drum sound and a guy who looks really mean - not some guy with a baseball cap round the back of his head and white sunglasses going 'I'm bad, I'm cool, I gonna break every roof'.

"The first house records were bass and snare drum, four on the floor with a bass groove running through it. It was so hypnotic it was brilliant. But now there's a million samples going on. Having said that, there's a lot of brilliant music in hip hop."

Beggs: "I hate it."

Ellis: "Doctoring the Tardis' blows all that S-Express and M/A/R/R/S stuff away because it's such a good piss take."

Beggs again: "I wish I'd made that record."

If Ellis and Beggs are critical of hip hop and house music you can be sure that the weekly music press are going to give them a hard time for promoting old-fashioned rock.

Ellis: "That's because all the left-wing journalists don't want to see rock musicians make a lot of money."

"Journalists want everybody else to think they've discovered something new", offers Beggs. "Rock 'n' roll and hard rock sounds have always been with us and always will be. It's very easy to slag something off that's established, yet they want to find something else that they will, in turn, make established. It's a complete contradiction. That's why I don't think you should take music very seriously - it's only music."

BRING UP THE subject of Beggs' bass and Stick playing, however, and you'll find that Beggs takes his music a little more seriously than he'd have you believe. First of all he'd prefer to be known as a Stick player rather than a bass player - a wish 'Big Bubbles, No Troubles' and the title track from the forthcoming LP, *Homelands*, go a long way towards granting. Then there's the opposition he met when he first introduced it to the other members of the band.

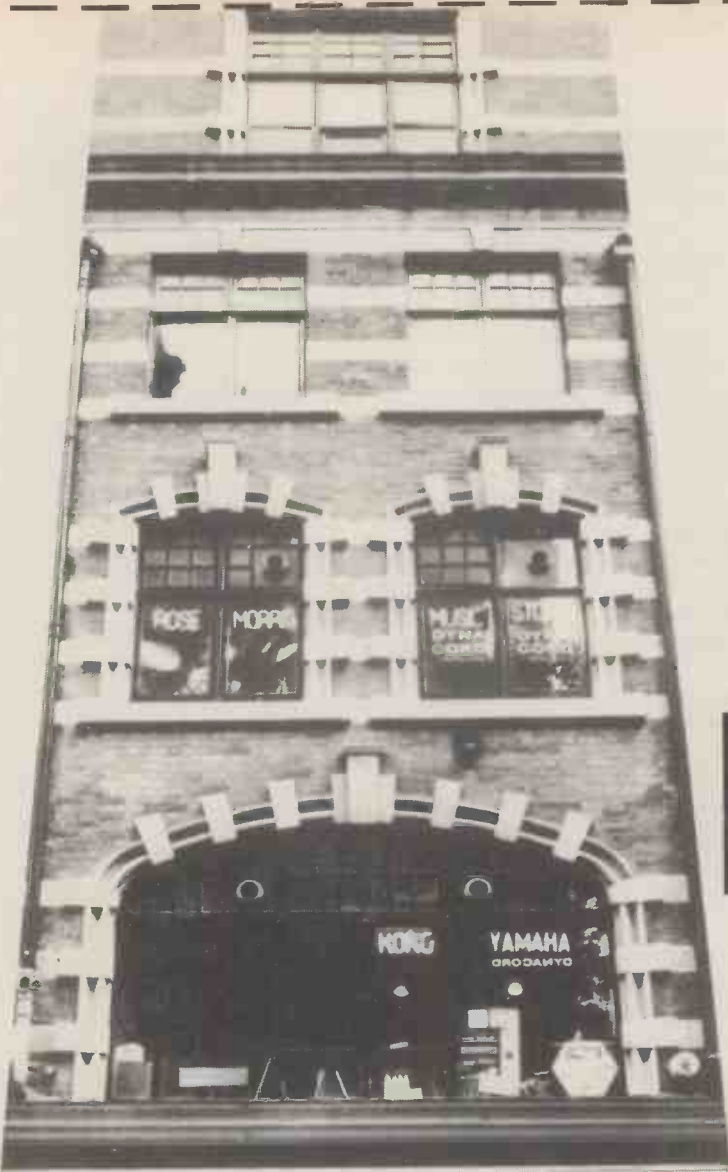
"I used to dread him picking the Stick up", admits Ellis with a grin. "He looks like a hippy with this big thing sticking out of his trousers. Seriously: when we were jamming and I'd see him put his bass down and pick up the Stick I'd think 'oh no, not that bloody thing again'. Then he started coming out with all these licks that freaked me out because I'd never heard anything like it before."

"I had to keep pushing it" confirms Beggs. "I think the Stick is more versatile than a bass because you have a melody expression as well as a bass expression. On a bass you have got melody expression but it's very linear. It's very exciting, because it opens a whole new vista of

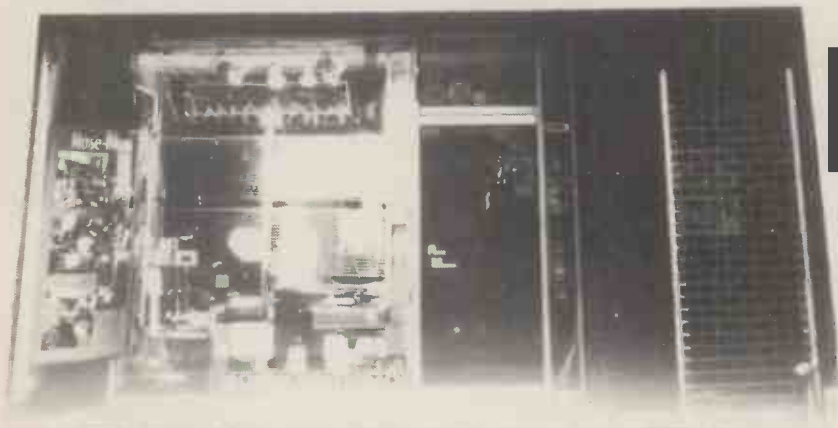
"Something is going to happen to music soon - I don't think it'll be like punk - what I think will happen is that there will be bands like us."

possibilities to the musician.

"I see the Stick as predominantly a percussion instrument in the same way that the piano is a percussion instrument. I think people, especially bass players, are intimidated by it but it's wrong to think of it as a bass player's instrument. Forget the bass when you pick up the Chapman Stick. It's got nothing to do with playing the guitar either and I'm surprised there aren't more keyboard players using it. The piano is the only



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► comparison to the playing technique, there is no other comparison you can make. If you watch a pianist he's got an arpeggio going with his bassline and he's playing a lick that's complementing it. You combine lead and accompaniment lines on a piano and you combine them both on a Stick. But most Stick players don't do that - Tony Levin doesn't do that, he only really uses the bass. And when he does use the top hand he uses a vamp approach. It doesn't mean it's not as good, it's just different, but it does mean the Stick is versatile and it's not being used to its full potential."

"We bought Ronnie Wood one for his birthday", interrupts Ellis. "He took one look at it and didn't know what it was, he was freaking out. But he sat down in the corner with it and within half-an-hour he was tapping out Rolling Stones numbers on it."

Even the stylish slapping technique Beggs became known for in his Kajagoogoo days has been sacrificed for the new sound of Ellis, Beggs & Howard.

"It doesn't suit the music", he explains. "I had a five-string Wal made for me to make this band sound right. It's really low, not clicky and slappy, but really low with a low B. I want this bass to sound like it could be in Steel Pulse. My ambition is to play a note that's so low it's not a note. I want to jellyfy people."

Whilst Beggs is clearly excited by the possibilities the Stick has opened up for him, he has reservations about the MIDI Stick.

Personally I'm not into synthesised sound, Simon comes up with all that stuff. It's not my forté. I think the acoustic rock 'n' roll instrument is the side of it I'm supposed to supply."

TURNING OUR ATTENTION to Simon Ellis' keyboard rig we encounter the eclecticism that is the trademark of Ellis, Beggs & Howard once again. For alongside the predictable DX7II and D50 there's a beautiful Hammond C3, vintage '63 - I read the inspector's label. Although it now bears evidence of Howard's stage antics, Ellis describes it as his "pride and joy".

"A guy about 60 years old had it. He bought it brand new and it looked as if it had never left his front room. Then this young kid bought it from him and sold it to me. It's the best Hammond I've ever heard."

As well as making their own contributions to the EBH sound, the DX7 and D50 act as master keyboards for a Roland Alpha Juno 2, JX8P and a rack containing an Akai S900, Roland Super Jupiter and MKS20 piano module. There's also a Yamaha RX11 for drum sounds and a Roland MC500 for a little sequencing. A Yamaha DMP7 handles an automated mix under the

"Sampling is controversial and the Musicians' Union must hate it, but what do you do? It's technology, people want it and it's so easy."

guidance of a Sycologic M16. All in all, a very effective setup.

Much of the gear arrived as part of the record advance ("All I did for six months was read instruction manuals"), but the old polysynths were there from the start.

"The JX8P has got the best sounds ever on a keyboard", enthuses Ellis. "The hook line from 'Big Bubbles' is just a tinny old sound from it. At the time we wrote that song that was the only ►

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▶ keyboard I had to write with. I'm really pleased I didn't have the setup I've got now because the song wouldn't have sounded the way it does, it would've sounded big and horrible. When we write the next album I'm going to write with just two or three keyboards - the JX8P, the D50 and maybe a couple of rack things. Then I'll have to find all the brilliant sounds that you'd never really use because you're using some massive brass sound from 25 synths. I'll go back to basics

get a KX88, then I'll get a nicer piano module and rack the D50. I miss some of the sounds on the DX7I - like the fuzz guitar and clav sounds I used on the album - they just don't have the bite of the old presets. So eventually I'd like to get some of those sounds back."

Quite how the band will achieve major success without the co-operation of the press, and how well they will live up to comparisons with the Rolling Stones only time will tell. But the band's



again like we did in the first place."

The RX11 was also there from the start, although the S900 provides many of the sequenced drum sounds.

"I use it mostly for drum sounds and a few backing vocal sounds that need layered voices. We put the backing vocals for 'Big Bubbles' in there because we needed a really big sound that the band can't sing live. And on 'Where Did Tomorrow Go?' there must be about 36 voices in the backing vocals and I've sampled those off the multitrack.

"I've got some great drum sounds and some Louis Jardine percussion sampled from our multitrack and I've got a Scritti snare . . . It's controversial and the Musicians' Union must hate it, but what do you do? It's technology, people want it and it's so easy.

"Keyboard playing must be the worst job in the world for equipment because you always want a bigger sound and you always have to update your equipment. In the next few months I want to get a second desk and another couple of Akais - probably S1000s because they're compatible with the S900. Eventually I'd like to

own energy and enthusiasm are as infectious as their single. In musicians' circles, the word is that Beggs is a player to watch. As Ellis points out, there are still music papers that won't touch Ellis, Beggs & Howard because of Beggs' Kajagoogoo history.

"It's not my problem", says Beggs lightly, "it's everybody else's problem. I made a lot of money out of Kajagoogoo, I had a lot of musical fulfilment and I had some very good times. There were mistakes that were made, there were things that went wrong and there were people who couldn't handle it. But having said that, it was a lifetime's experience in two years and I'm lucky enough to have a second bite at the apple. I just knew it was going to happen as soon as I met Simon and Austin. I thought 'now, your waiting's over, just go for it'.

"NME and *Melody Maker* won't touch us, they won't give us an interview because I used to be in Kajagoogoo. But one day they'll come and interview us so anyone who reads this and then reads an article in *NME* or *Melody Maker* later on can write in and say they're complete hypocrites - because they are." ■

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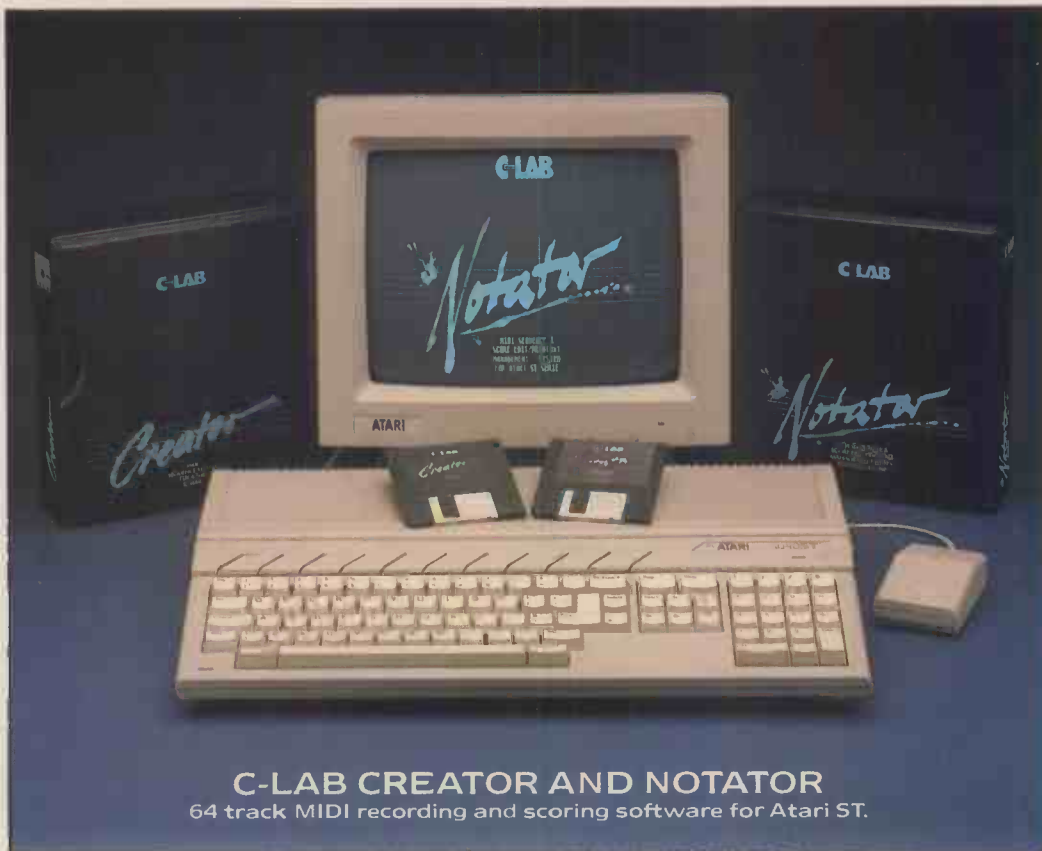


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OBERHEIM

MATRIX 1000

Synth Expander



Photography Adam Jones

With digital synths now dominating the ears and the wallets of keyboard players, is there still a place for the analogue synth?

Review by Simon Trask.

IT'S NOW BEEN some two years since Oberheim brought out the Matrix 6 synthesiser and the cheaper Matrix 6R rack-mount expander. Those instruments made the state-of-the-art analogue synthesis capabilities of Oberheim's Matrix 12 and Xpander synths available at a relatively affordable price – a move which many musicians thanked Oberheim for, no doubt. But were the 6 and 6R to be the end of the Matrix line? As the company moved into the sampling arena with the DPXI sample replay unit, it seemed that was the case.

But the success Oberheim enjoyed with the DPXI presumably set them thinking about adopting a similar approach with Matrix synthesis. Here was a method of synthesis which offered probably more parameters and modulation possibilities than just about any other system, yet that very flexibility required a great deal of programming effort to get the very best out of it. So, just as the DPXI was able to draw on a large library of samples but couldn't itself sample, why not a synth which offered a large number of patches but didn't itself have editing facilities? Cue the Matrix 1000.

Essentially what Oberheim have done is take the circuitry of the Matrix 6 synth and 6R expander and, through making use of advances in technology, packaged 1000 sounds in a 1U-high 19" casing for half the original retail price of the 2U-high 19" Matrix 6R. Now that's what I call progress.

However, there have been compromises along the way. Along with the absence of programming facilities, the Matrix 1000 forgoes the bi-timbral capabilities of the 6/6R and sports only a monophonic audio output. But you've still got six voices, and then there are those 1000 sounds . . . Now, you may be thinking that Oberheim's programmers must have been extremely busy, and in a sense you'd be right: the expander's sounds have been compiled from patches submitted by Matrix owners worldwide, Oberheim's task being to pick the cream of the crop. Matrix 6/6R owners needn't feel left out, as they can obtain a cassette data tape of all 1000 sounds to load into their own instrument.

Programming

OBERHEIM HAVE TRIED to come up with an effective balance between a preset and a programmable instrument, and to this end the 1000 has 800 patches in ROM and 200 in RAM. While there are no onboard editing facilities, new

sounds can be loaded into the 1000's RAM memory via MIDI SysEx dumps from a Matrix 6/6R or appropriate patch editor/librarian software (Dr T's, for example). What's more, any of the 1000 patches which come with the expander can be transmitted via MIDI for external editing, and then loaded back into the RAM memory (obviously not into the ROM). You can transmit the current patch, all patches in the currently-selected bank (the Matrix 1000 divides its patches into 10 banks of 100 patches each) or all 200 patches of the RAM memory (000-199). The 1000 will receive individual patches and patch banks in the same way at any time, if memory protect is off (of course you can't load sounds into the ROM memory locations).

Operation

OBERHEIM HAVE KEPT the 1000's front panel admirably straightforward and uncluttered. A central three-character LED window takes care of the patch-number and parameter displays, while a Select button allows you to cycle around the six Function LEDs and parameter editing is taken care of by number and +/- buttons. The rear panel is even simpler: MIDI In, Out and Thru sockets plus a monophonic audio out jack socket.

Unfortunately, the limited display capability of the 1000's LED window means that none of the patches have or can be given names. Who knows what wonderfully inventive names have been lost in the transfer from 6/6R to 1000? Considerably more importantly, remembering where your favourite patches are becomes more difficult if you're not able to associate names with the numbers. With one thousand patches it can be like trying to find a needle in a haystack, particularly as Oberheim seem to have thrown their patches into the 1000 with no thought for grouping.

Fortunately you can organise up to 200 patches yourself in the RAM memory, as a Copy function allows any of the 1000 patches to be copied to any RAM patch location (obviously you'll need to be able to store off the existing RAM sounds first).

Sounds

OBERHEIM'S INTENTION IS to provide as many variations on various types of sound as possible, so that instead of having to tweak a sound yourself you can ▶



▶ probably find an existing variation to suit. As mentioned earlier, the sounds aren't grouped in any particular fashion, though in general the 600s are given over to string sounds, the 700s to bass sounds, and the 800s to effects. Perhaps Oberheim want to make the scope of the 1000's sounds as apparent as possible to the casual punter flicking through the patches.

One disconcerting feature of the 1000 is the many and sometimes extreme variations in volume level between different patches.

As I said, the only identification each of these 1000 sounds has is a three-digit number, so the first thing you'll need to do is get out pen and paper and start jotting down descriptions of the sounds which take your fancy. Not very hi-tech.

As with its predecessors, the Matrix 1000's forte lies with rich, smooth ensemble string sounds, fat brass sounds, a wide range of gut-wrenchingly powerful synthbass sounds, and numerous special effects and background atmospheric sounds.

Patch 50 is the sort of sound I love Oberheim synths for: warm, smooth strings as plush as velvet. Patch 78 serves up eerie floating strings, while patch 221 offers slow-motion "cosmic" strings (I never thought I'd use that word again). As we've already seen, there are numerous variations of the Oberheim string sound to be found in the 600s.

Patch 06 is a raspy, filter-swept brassy sound that goes "pssshoooooh" and sounds like it might have come from an early Tangerine Dream album. In a similar vein, check out (if you must) patch 311.

Patch 72 is the archetypal mega-fat Oberheim brass sound, but the 1000 is also capable of more delicate sounds

"Group mode is a means of increasing polyphony through chaining up to six Matrix 1000s together - to a maximum of 36-voice polyphony at a cost of £3000."

such as patch 62, a prepared piano-like mixture of metallic bell chime and plucked piano strings, the penny whistle of patch 491, the calliope of patch 502, and the tinkling bells of patch 887. You can also find "pure and natural" sounds on the 1000, such as the clean French-horn sound of patch 512 and the piercing strings of patch 184.

Keyboard sounds are less in evidence, but there are some effective sounds such as the gentle electric piano of patch 57, the warm tremoloed electric piano with bright tine attack of patch 63, and the harsh metallic-edged acoustic piano of patch 100. On the organ front, the rich Hammond-style organ of patch 61 and the fluted church organ of patch 564 are well worth a listen.

The 1000's collection of synth bass sounds vary from the

dark and deeply resonant to rasping staccato (less refined people than myself might say "farting") sounds which provide a timely reminder that the slap-and-pull style of bass playing doesn't have the monopoly on funkiness. My particular favourite in the latter department is patch 146, a dead ringer for the synth bass on Herbie Hancock's classic 1973 track 'Chameleon' (now that's funky).

Sound effects reside in the higher reaches of the 1000's memory, although not exclusively, due to the lack of programming structure. There are explosions (845), heartbeat (842), gusting wind (869), thunderstorm (56), massed air-raid sirens (216), jet flying past (848), together with various atmospheric background rumbling noises (850 and 868) which would fit well into a sci-fi context (dare I mention *Bladerunner* here).

Patch 52 is one of those famed Matrix sounds which plays with itself for ages (well, 45 seconds) in an orgy of self-modulation; not recommended for uptempo music. An even more impressive version is patch 899: one key-press sends the 1000 off into fits of violent filter-cutoff modulation on a big brassy sound.

Sounds can be further fattened up by selecting Unison mode, which layers all six voices on a single key (obviously best for monophonic bass or lead sounds). Some of the 1000's patches are pre-programmed to be in Unison mode, but you can easily override this, or set non-unison patches to unison, by setting Extended Function one on/off appropriately.

Inevitably I've only described selected sounds, but in many cases you will find numerous variations on them.

Channels and Things

THE 1000 CAN be set to send and receive on a single MIDI channel (1-16), receive on all 16 channels and send on channel one (Omni on) or receive on six consecutive MIDI channels (Mono mode four).

The latter option does not turn the Matrix 1000 into a multitimbral instrument. What it does do is assign each of the synth's six voices to a consecutive MIDI channel (the basic channel can be any one of channels 1-9) and allow them to respond independently to note, pitchbend, volume and aftertouch information (modulation and sustain-pedal information are still received on the basic channel only, and applied to all six voices alike).

Other front-panel features include global transpose (+/- three octaves in semitone steps), global fine-tuning (+/- a quarter-tone in 31 steps), memory protect on/off, invert MIDI volume (useful for crossfades with other instruments) and a test mode which can, among other things, be used to auto-calibrate the 1000's audio circuits. Additionally, a simple reinitialisation routine can be activated if the 1000 starts behaving strangely (not that it ever gave me any problems); the stored patches won't be affected, but all the other parameters will be reset to default values.

In addition to velocity and channel aftertouch, the 1000 responds to pitch-bend, mod wheel, breath control, volume, sustain pedal and Pedal One. The latter function has been included to provide compatibility with the 6/6R, on which it can be programmed to control a wide variety of patch parameters. On the 1000 it can be assigned to any MIDI controller from 0-121.

Patch Selection

PATCH SELECTION FROM the 1000's front panel is a straightforward affair (made even easier by the Bank Lock feature, which allows you to punch in two instead of three digits), but selection via MIDI is a bit more problematic. ▶

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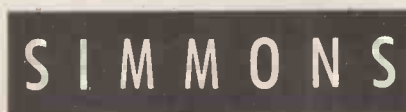
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► Those of you who are good at arithmetic will have realised that 1000 patches into 128 MIDI patch changes just doesn't go.

Oberheim's solution is as follows: pushing the mod wheel on your master keyboard beyond halfway tells the 1000 that the next patch number (0-9) should be used to change banks. Enter the appropriate bank number, reset

patch variations, and decide whether you want to layer some patches and not others.

Matrix 6/6R owners will be glad to know that Group mode will give them 12-voice polyphony if they slave a Matrix 1000 to their instrument (page 32 of the 1000's manual explains the rather tortuous procedure involved).

"The Matrix 1000 may include some dated sounds, but to my mind the unique rich, warm and fat quality of the Oberheim Matrix sound simply doesn't date."

the mod wheel and then enter a two-digit patch number (00-99). Hopefully you won't be using lots of modulation when you try to change patches within a bank. As an alternative, you can use MIDI controller 31 to fulfil the same function.

A further function available from the 1000's front panel is MIDI Echo on/off, which isn't a MIDI alternative to a delay line but a means of passing on (echoing) received MIDI data via MIDI Out - for instance if you want to layer more than one Matrix 1000. All data apart from active sensing is echoed, though Oberheim advise that it's best not to echo MIDI Real Time clocking information.

Grouping

THE MATRIX 1000 introduces a new feature known as Group mode to the Matrix series. Essentially this is a means of increasing polyphony through chaining up to six 1000s together (to a maximum 36-voice polyphony at a cost of £3000). Whereas MIDI Echo would still give you six-note polyphony, but with six layered sounds, Group mode cleverly "rotates" notes around the six (or however many) 1000s you have. You define the number of units and a unit number of zero on the master 1000, and consecutive unit numbers on the slave 1000s. The master 1000 plays one note itself and then (re)transmits the next five notes (for a six-unit Group) on consecutive MIDI channels 2-6 (unit numbers 2-6). Bank and patch changes on the master are automatically transmitted to the slaves. You can set Group mode on or off for each of the 1000 patches, and as Group mode overrides MIDI Echo it's an easy matter to switch between layered sounds and many-voiced sounds.

Although Group mode is similar in effect to the Overflow mode found on some other instruments, it's a lot more flexible. You can produce controlled panning effects, step through a controlled sequence of patches or

Verdict

JUST AS TOP studios are looking around for old valve components to "warm up" their increasingly digital world, so musicians faced with today's extremely competent digital synths are asking what's available as an analogue complement. In our experience here at MT the question usually takes the form of "Now that I've spent most of my money on digital gear, what can I get for under £500 that's analogue?"

Though it nears the top mark of that range, the Matrix 1000 is an ideal choice. Many of its sounds are not what you'd call "realistic" in the sense that they sound like imitations of or variations on acoustic instruments, but as a result they complement perfectly the direction taken by so many of today's digital synths. The 1000 may include some dated sounds, but to my mind the unique rich, warm and fat quality of the Oberheim Matrix sound simply doesn't date.

Beyond the sounds, it's good to see that Oberheim have put some thought into how their latest expander should relate to the outside world. Consequently they've included a programming "window" via MIDI, and added such features as Group mode and Mono mode. The wealthy musician can contemplate the delights of using several Matrix 1000s Grouped together, while existing Matrix 6/6R owners might find the 1000 a very useful addition to their setup.

Finally, don't let the 1000's modest number of voices and lack of multitimbral capability lead you into feeling short-changed. It's the sounds themselves that are the real wealth of this instrument.

To my mind, a whole new generation of musicians will be thanking Oberheim for bringing out the Matrix 1000. ■

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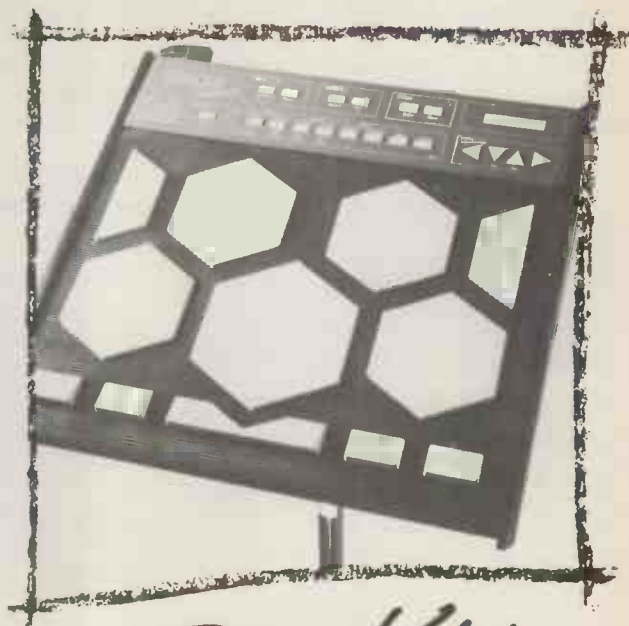
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ENSONIQ ESQ1

Steamroom
Volke Cat, Isle of Wight

The ESQ1 pops up yet again with this useful patch, which its creator modestly describes as "a versatile sound that reminds of a steam whistle". There's more than a hint of deep, full, breathy vocals in there too, and as Volke says, "it's good for basslines, as well as sustained backing chords". ■



	OCT	SEMI	FINE	WAVE	MOD1	DEPTH	MOD2	DEPTH
OSC1	-1	00	00	SQU	LFO 1	+04	ENV1	00
OSC2	-1	00	03	SQU2	LFO 1	+05		
OSC3	0	00	00	NOISE2	OFF		OFF	

	LEVEL	OUTPUT	MOD1	DEPTH	MOD2	DEPTH
DCA1	30	ON	ENV 2	+51		
DCA2	31	ON	ENV 2	+51		
DCA3	00	ON	ENV 1	+54	KBD 2	-20

	FREQ	Q	KEYBD	MOD1	DEPTH	MOD2	DEPTH
FILTER	000	02	51	ENV 3	+50		

	FINAL VOL (ENV4)	PAN	PAN MODULATOR	DEPTH
DCA4	63	08	LFO 2	+47

	FREQ	RESET	HUMAN	WAVE	L1	DELAY	L2	MOD
LFO1	20	OFF	ON	TRI	00	01	00	WHEEL
LFO2	12	OFF	OFF	TRI	63	00	20	OFF
LFO3								

	L1	L2	L3	LV	TIV	TI	T2	T3	T4	TK
ENV1	+63	+19	00	16	00	00	38	00	00	01
ENV2	+63	+30	+14	00	00	21	40	48	27	00
ENV3	+63	+23	+01	29	22	00	20	40	37	15
ENV4	+63	+47	+00	29	06	08	41	63	19	09

	SYNC	AM	MONO	GLIDE	YC	ENV	OSC	CYC
MODES				00				

	SPL/L	S/LPROG	LAYER	L.PROG	SPLIT	S.PROG	S.KEY
SPL/L							

CASIO CZ1000

Acousticon
Paul Reilly, Glasgow

Paul came up with this patch after realising that, though there was no shortage of electric guitar patches, good acoustic guitar sounds were few and far between. 'Acousticon' has a crisp attack and mellow sustain, is very realistic, especially in a mix, and as Paul points out, is an effective bass sound when played on the lower part of the keyboard. ■



PARAMETER

LINE SELECT	MODULATION		DETUNE				VIBRATO				OCTAVE	
	RING	NOISE	+/-	OCTAVE	NOTE	FINE	WAVE	DELAY	RATE	DEPTH	+/-	RANGE
1+1 <small>(1,2)+2,1+1)</small>	ON <small>(ON/OFF)</small>	OFF	+	1 <small>(+/-)</small>	07 <small>(0-3)</small>	01 <small>(0-11)</small>	1 <small>(1-4)</small>	00 <small>(0-99)</small>	00 <small>(0-99)</small>	00 <small>(0-99)</small>	0	0 <small>(+/-) (0-1)</small>

1

DCO 1

WAVE FORM	
FIRST	SECOND
2 <small>(1-8)</small>	4 <small>(0-8)</small>

E N V (PITCH)								
STEP	1	2	3	4	5	6	7	8
RATE	50							
LEVEL	00							
SUS/END								

DCW 1

KEY FOLLOW
7 <small>(0-9)</small>

E N V (WAVE)								
STEP	1	2	3	4	5	6	7	8
RATE	97	66	50	53				
LEVEL	99	79	74	00				
SUS/END								

DCA 1

KEY FOLLOW
0 <small>(0-9)</small>

E N V (AMP)								
STEP	1	2	3	4	5	6	7	8
RATE	99	34						
LEVEL	99	00						
SUS/END								

Philip Rees

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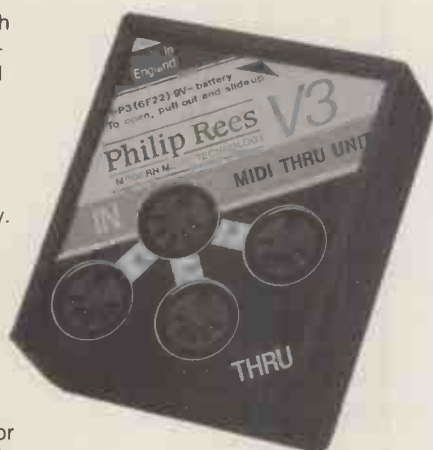
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ROLAND S330

Sampling Module



Photography Adam Jones

Sampling is arguably the most popular application of modern instrument technology. Roland's S330 module aims to make quality sampling more readily available to the "average" musician. Review by Gordon Reid

YOU MAY NOT realise it but 1988 is the silver jubilee of the sampler - I hope you'll join me in wishing it a very happy 25th birthday. Admittedly, the 1963 vintage is a little long in the tooth now, but nevertheless, the equivalent of £5000 at today's prices bought some pretty advanced facilities. Six patches could be held "in memory" at any one time (although changing them could be a bit of a job), of which combinations of up to four could be played simultaneously with 88-note polyphony. Sample quality was excellent, with no quantisation or aliasing problems whatsoever, but no onboard modulation or envelope controls were available. Volume and pitch controls were built in, and a rhythm unit was included, although this was a little inflexible by today's standards. To complete the package a reverb unit was included and the whole output then sent to a powerful amplifier and four speakers that were provided with each sampler. Points against the unit were its weight (a little under five hundredweight) and its inherent instability - which had some users building fan-heaters into their machines to stabilise the internal temperature when performing. The double manual Mellotron had arrived.

Nothing much then happened for nearly 20 years until the advent of the original Fairlights, Synclaviers, and Emulators. On the affordable side, samplers were introduced by Akai and Ensoniq (amongst others) but the "big guns" of Roland and Yamaha were surprisingly quiet. Roland eventually released the S10 (of which the least said the better) and S50 keyboard samplers, followed by the MKS100 and S550 19" modules. The MKS220 superceded the MKS100 late last year but still Roland failed to really crack the popular sampler market. Which brings us neatly onto their latest offering - the S330 Sampling Module,

which is aimed right at the cost-conscious musician or budget studio.

The Look

THE S330 HAS the typical style and evocative good looks of all 1U-high 19" rack-mount units - none. However, it's surprising how much difference a few well thought-out external features can make to the overall feel of a system. The left of the front panel sports a 32-character readout, dual concentric pots for record level and volume, and quarter-inch sockets for audio input and headphone output. Finally, on the far left is a recessed male 9-pin D connector for the optional RC100 remote control or mouse. The RC100 was relatively unnecessary on the S550 (since it only duplicated the front panel controls of that unit), but it could be a worthwhile addition to the S330 which has a much more limited set of switches. The mouse, at approximately £60, is too expensive but very useful, simplifying the operation of the sampler as well as speeding it up considerably. Unfortunately, my Atari 1040ST mouse did not work when plugged into this socket. One feature to note is the high gain of the Record Level control, which allows sampling from both microphone and line with no difficulty whatsoever.

To the right of the screen are 12 micro-switches, the 3.5" disk drive, and finally, the on/off switch. On the rear of the machine are outputs for monochrome (composite) monitor, RGB monitor, the entirely necessary MIDI In, Out and Thru, and the audio outputs - of which there are eight individual, and a single mixed output.

Annoying niggles: Firstly, the individual outputs are of the protruding, silvery coloured variety - phono plugs.

MUSIC TECHNOLOGY AUGUST 1988

(The mixed output is, however, a nice, sensible, quarter-inch jack socket.) Why Roland should have chosen phonos on the S330 when the similarly designed DI10 L/A module has eight individual jack sockets, escapes me. Perhaps they ran out of room internally and couldn't fit the recessed quarter-inch sockets inside. The next complaint concerns the mains socket - because it doesn't exist. In common with the DI10, the P330 piano module, and the DEP series effects, the S330 has a fixed mains lead. This may be acceptable in a studio where everything is (theoretically) neatly wired in, but using Roland's own 2U flight cases, and having the plug flapping around inside during transportation makes a mess of the back of the sampler as well as any other unit(s) in the case. The disk drive front plate was not correctly attached on the review unit (which was clearly previously unused) and although it only took a few minutes to fix, a little more quality control would have stopped that happening. One final point about the physical usage of the S330 concerns the DT100 digitiser ("drawing tablet"). I have seen reports that the DT100 will work with the S330 but believe me - it doesn't. You have been warned. Personally I don't give a damn, because the mouse gives better control and superior resolution to the DT100 anyway. Niggles notwithstanding, the overall construction of the S330 is first class and great care has been taken both internally and externally to ensure longevity and freedom from defects.

The Performance

REVIEWS SHOULDN'T READ like technical manuals, because, in the last analysis, it's sound quality that matters (does an Emulator II owner worry that he's got 4 bits missing?) and the S330 is susceptible to underselling itself on specification (see DI below). But you can't fully review a hi-tech electronic instrument without discussing its features, so...

The Roland S330 is a 12-bit sampler with a 16-bit output stage (the reason for which will become clearer later). Onboard RAM is 512k which holds 32 Tones, each of which can be a sample or a manipulation of a sample - therefore you could have 32 separate samples onboard at any one time, or one sample and 31 modified versions of it, or any combination in between. The machine has 16 voices (is 16-note polyphonic) which, although no longer unique in this price range, is certainly good value. A Patch can be made up of any number or combination of Tones, and eight Patches can be accessible at any time. Fully multitimbral polyphony is what the market now demands and the S330 certainly delivers this. The module will play polyphonically over eight MIDI channels through any combination of the eight individual audio outputs. In addition, any Patch can be output through any of the individual sockets and indeed, even the Tones within a patch can be assigned to separate outputs. Another important feature for the studio user is that the outputs are not restricted to MIDI channel setups and I would venture that this module offers the most flexible voice assignment of any sampler under £3000.

Sampling can be performed at 30kHz or 15kHz giving approximately 14kHz and 7kHz bandwidth respectively. I found that sampling at 15kHz was adequate for the majority of applications (such as sampling the sound effects of crusty old TV sci-fi space operas) and, as with all samplers, had the additional benefit of acting as a 7kHz low-pass filter, eliminating hiss. However, there is an important difference between this and other samplers if you wish to use the lower frequency sampling rate. Due to a process called "Differential Interpolation" (DI) the S330 maintains its 15kHz clock rate even when playing notes well below the sampled pitch. To understand the

importance of this imagine a note of 6kHz sampled at 15kHz. On a conventional (variable clock-rate) sampler, if you played the sample back three octaves lower than the sample pitch (at 633Hz) the clock speed of the sampler would be down to 1875Hz - too low for faithful reproduction, giving a very "grainy" nature to the sound. The Roland, however, uses DI to "fill in the gaps" between sample points in a particularly realistic manner, allowing the clock speed to be maintained at the original sample rate of 15kHz. Result: more faithful reproduction. The outcome is that the S330 certainly does sound like a 16-bit sampler (unlike some 16-bit samplers which, due to excessive filtering, sound more like 10- or 11-bit). It also explains why Roland used a 16-bit output stage when, in principle, 12-bit should have been adequate.

The 512k RAM has room for two banks of 7.2 sec samples at 30kHz (a total of 14.4 sec) or a total of 28.8 sec at the slower rate. Unfortunately, the two banks cannot be run together. Although this is a shame, I never actually found it a handicap. The operating system, which is supplied on 3.5" disk, takes up approximately 80k of RAM but, far from being a deficiency this has an important benefit. Since the OS is always loaded from disk and not held in ROM, the S330 is what Roland call a "clean computer design". This means that, as all the system and performance data are held in software, these can be updated with new features or facilities simply by loading a new disk. Also worthy of note is the fact that the OS is held separately from the Utilities, which are loaded into the S330 one at a time when required. Therefore any number of utilities can be developed and used without decreasing the amount of memory available for sampling. I like it.

The S330 is remarkably quick and straightforward to use. Even exclusively using the front panel is a simple and clear-cut procedure but with the mouse the facilities could be accessed spectacularly quickly. Maybe this operating system will be the benchmark against which the speed of the next generation of budget samplers will be measured.

One thing Roland fail to mention in their blurb is that it is impossible to use the S330 properly without a monitor. This is because no input level information is supplied on the front panel display. Funnily enough, early S50s had this facility but it was removed in a software update because of memory considerations. I would have thought that some sort of clipping warning could be given, but without this you just have to use a monitor. RGB (colour) is preferable since various items of on-screen information are colour coded for clarity, but a monochrome monitor is quite

Quality *"The S330 certainly does sound like a 16-bit sampler unlike some samplers which, due to excessive filtering, sound more like 10- or 11-bit."*

acceptable. It is an annoying anomaly that when using a monochrome monitor, some of the S330's screens have differing brightness and contrast, so that unless your monitor is particularly forgiving (or you are) you find yourself occasionally adjusting the brightness and contrast controls. Curiously, the problem did not occur on my colour monitor. Roland are aware of the problem and I presume that they will take steps to fix it. One small niggle about the RGB socket: it doesn't seem to conform to any standard. I may be wrong here, but if not, it would be nice to see the output modified to take a standard off-the-shelf lead such as a BBC micro or Atari ST RGB cable.

Having coughed up another £70-£500 for your monitor (depending upon taste or recording contract advance) you're ready to use the S330 as a sampler, rather than as a preset synthesiser. As well as the usual sampling abilities (which, for the sake of brevity, we'll take as read) the S330

► has two new abilities which I'll call "psychic sampling". Firstly, there is Pre-trigger sampling. Since a tremendous amount of the information of a percussive sample is held in the first cycle, and a sampler takes up to half a cycle to get going, very important information is lost with conventional triggering. Pre-triggering allows you to add information onto the front of the sample from the period immediately before the S330 was triggered. The second, Previous sampling, allows you to set the sampler up ready to record and wait for the particular sound you wish to sample. As soon as the sound has finished press the execute button to trigger the sampler, and you have your recording. Both of these facilities are possible because the unit is constantly sampling the outside world, and the memory of the system is constantly being filled and cleared of sample information. In the first case, you simply tell the unit to keep the

Looping *"Crossfade looping seems a bit hit-and-miss. I actually got different results at separate attempts using the same loop points."*

required amount from before the trigger. In the second case, the trigger tells the S330 to stop sampling and leave the memory intact. After using either of these modes you trim the sample in the edit page for the required result. Psychic sampling.

Editing facilities are all that you could hope for on a unit of this price. Every tone has an independent eight-stage Time Variant Filter (that's a fancy name for a VCF) and an independent Time Variant Amplifier (why not just call it an Envelope Generator?). These give tremendous flexibility, enabling single samples to be modified to produce endless variations on an original theme. Hence the earlier point that Tones need not be separate samples. The S330 has 32 totally independent filters, envelope generators, loops and LFOs. 32 of everything – giving a wide variety of different effects which can be accessed from the dynamics of the keyboard or MIDI guitar as well as allowing the building of complex sounds from relatively little initial sample information. (Actually, the hardware only has 16 of each function because the S330 is 16-note polyphonic, but the software remembers and assigns individual parameters to all 32 Tones and switches them in as and when necessary.)

Looping offers all the standard options, and is extremely quick and easy using the mouse. My only reservation here regards the crossfade looping which seems a bit hit-and-miss. I actually got different results at separate attempts using the same loop points. In common with all other samplers I found autolooping absolutely useless for strings, brass, and voices (where the harmonic spectrum changes dramatically over the course of the note) but achieved very satisfying results on acoustic guitar, eventually getting down to an acceptable single cycle loop.

The S330 offers even more flexibility by allowing Wave Redrawing. I watched Roland product specialist, Nick Magnus demonstrate this (admittedly on an S550, but the operation is identical on the S330) at the '87 British Music Fair. Simply by selecting the Wave Draw option from the Utilities you can draw or re-draw any part of the sampled waveform using the mouse. The example shown at the BMF was the attack portion of a bass drum sample which was firstly smoothed (no apparent beater-click – a very mellow sound) and then made very noisy (very prominent click for a more percussive sounding drum). Because the S330 holds 32 Tones it follows that a complete drum kit can be created within memory with all the variations of a "real" drummer. Add this facility to the extensive TVF and TVA envelopes, and a single bass drum sample can be used to produce a whole variety of drum sounds, from soft to hard, gated and reversed, mellow, coarse, tuned... Many more functions are available on the Edit, Looping, and

Utilities pages but I don't intend to rewrite the manual. If you want to know more, it's time to find your nearest dealer.

The Sound

AND SO IT'S finally time to output your masterpiece of sonic creativity. As already mentioned, the output assignment leaves almost nothing to be desired. If you are using the S330 as a multitimbral expander you have 22 different modes of polyphony for the eight channels, as well as two additional "floating" modes – first note priority, and last note priority. In a floating mode the sampler will steal unused voices from any available channel and use them to cover the requirements of channels in use. However, if you give the sampler the freedom to steal it can cause unwanted clipping of sounds with a long decay (such as cymbals). Just take a little care of how much you ask the S330 to do.

How does it all sound? The test of a sampler has to be the ease with which patches can be created, and the quality of the results. With the S330 the initial sample quality, the flexibility of the editing, the speed of experimenting with loops and multiple layers and the DI output quality, all conspire to make sound creation quick and painless. And the acid test? It's happenin'. I took samples from sources as diverse as voice, flute, screaming 10 year-old, Crumar Organiser, and D50. In all cases the result would have been acceptable in a studio, each patch possessing a "live" quality that could be rich and vibrant, or percussive and aggressive, as required.

Roland were approached and asked for a few factory disks. They obliged by sending the entire S330/S550 disk library (the S330 has a Convert utility that allows conversion of S50/S550 disks to S330 format and back again). The samples were recorded in 16-bit resolution and the S330 does them complete justice. It would be inappropriate to single too many out (reviews to follow). Worth a mention, however, are the Indian and Japanese stringed instruments, and some of the Andean flutes. There is a life to them that cries out for creativity – each sound deserves compositions to show it off individually.

Verdict

WE'VE COME A long way since those first Mellotrons in 1963. The demand for samplers is already large and it's growing all the time. Roland finally seem to have decided that the mid-cost market is important to them and have produced the most complete package yet seen in this price range. They have stuffed it full of features previously available only at much higher prices and have carried over the DI technology from the S550, giving the S330 16-bit quality whilst keeping it as simple to use as possible. If they succeed in bringing the S330 to the attention of the "average" musician (whoever he may be) it deserves to become a very successful instrument indeed. Currently I don't think that there is anything else at the price to touch it – and if this all sounds as if I am won over to the S330 – it is intended to. I started writing this review with a unit supplied by Roland – I finished it owning my own. ■

Price £1,384 including VAT

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

I would like to acknowledge the assistance given by Nick Magnus (best known for his co-writing and production work with Steve Hackett) during the preparation of this review.

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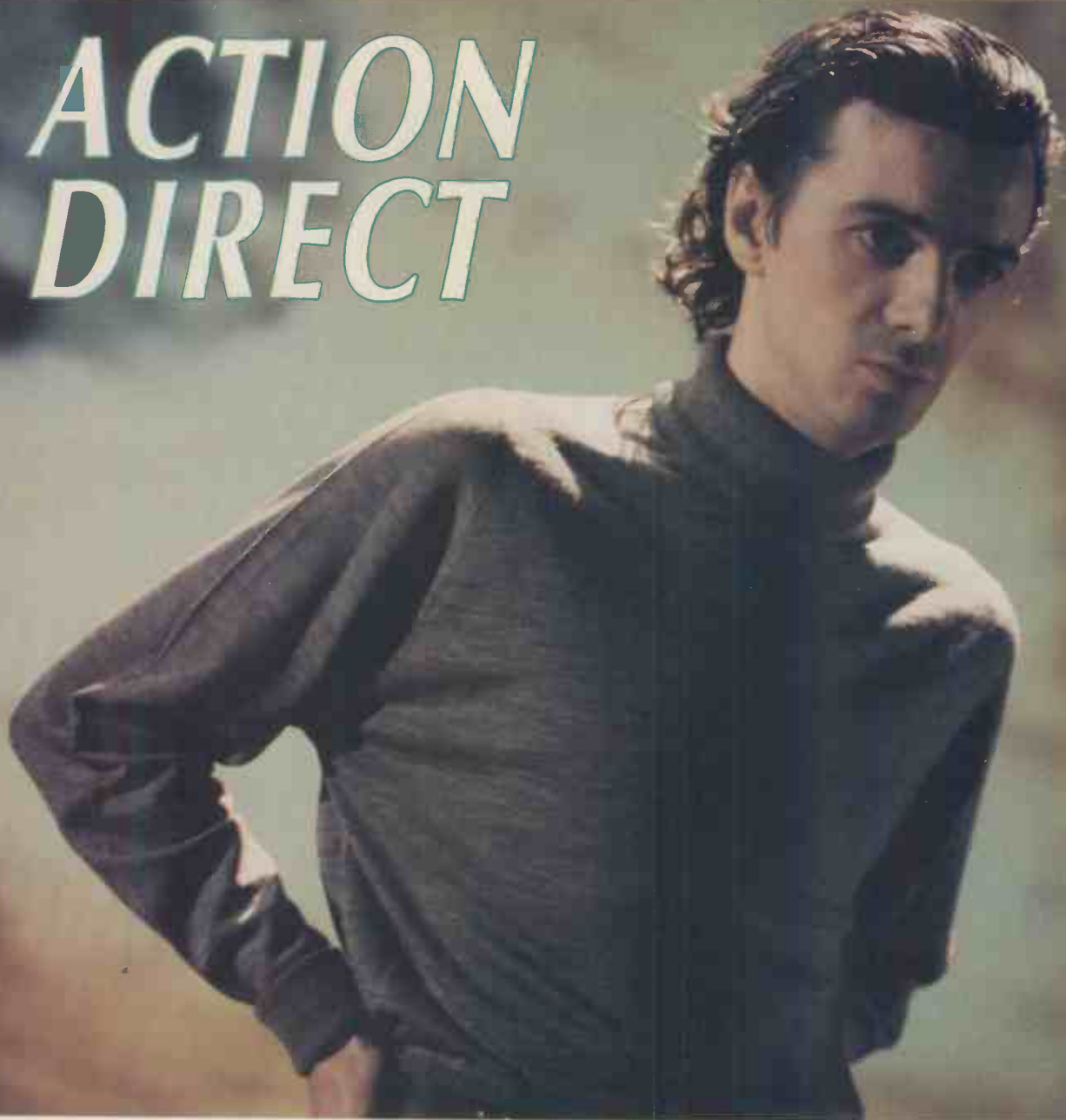
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ACTION DIRECT



If Propaganda had a Secret Wish it might have been that, after their demise, singer Claudia Brücken would team up with keyboardman Thomas Leer to form Act. Interview by David Bradwell.

IT'S THE SUMMER of 1987 - one of those lazy Thursday evenings spent in front of the television. You've yawned through *Top Of The Pops*, slept through *EastEnders* and fallen off your chair during *Tomorrow's World*. Suddenly, you notice that this is no ordinary edition of said programme - instead it's a "special" on electronic music. Part of the action is centred around Steve Lipson and a band called Act.

It is now the summer of 1988, and the memory of that lazy evening is but one thread in the donkey jacket of life. Act have vanished from civilisation, another flawed but interesting ZTT project destined to obscurity. Or so it would appear. For now Claudia Brücken and Thomas Leer are having a second try - with an album called *Laughter, Tears and Rage*, featuring tracks produced by Lipson and Trevor Horn as well as some of their own production work.

Leer will be no stranger to devout E&MM aficionados, having appeared on the cover way back in September '84. Brücken, on the other hand, was the face in front of and voice behind Propaganda, who never really achieved their deserved level of commercial success. She takes up the story:

"Propaganda were more of a studio band - that is how we were perceived. It was more a Steve Lipson production than four people being able to play. Ralf Dorper wrote the lyrics while Michael Mertens was the musician. But I always knew that to grow you have to be together, and you can't be based on four different opinions. You have to come across as one big state of mind and it never was like that. It is much more relaxed with Thomas and I, we're much more of a unit."

Brücken was still at school in Dusseldorf when her band teamed up with Trevor Horn and become another component in the ZTT machine. Leer, meanwhile, was suffering for his art alone at Arista. He recorded one album for them, but it was a far from happy time.

"I wrote the first project but before I'd managed to finance it I'd already written the next", he explains, "so I had to go somewhere for a deal, scrap the second project and then write something new. I did an album called *Scale Of Ten* for Arista, but I just didn't get on with the record company. The ideas that I had for presentation, and the way that I wanted to record the album, were more in line with what I was reading about ZTT at that time. I think there

was a similarity of spirit between me and Propaganda, although interviewers were continuously comparing me to them musically.”

At this time, Leer had his own Fairlight Series II on which had built up a considerable sound library. But that comfortable situation was to come to an untimely end when the Fairlight was reclaimed by Arista on his leaving the label. Leer retains a great deal of sentimentality for his old Fairlight but he's not so enthusiastic about the Series III, however, preferring the older model's grainy, eight-bit sound quality.

“I was listening to my old album a couple of weeks back, as a matter of interest, and I realised that the sounds were really good, even though I thought it was just crappy eight-bit sampling at the time. Now I prefer it to some of the things we've done on the 16-bit Synclavier. Actually, I think the future for both the Fairlight and Synclavier is very bleak - they will become dinosaurs in a couple of years, and everybody will be selling them off. The Synclavier is far too big and far too expensive, and the things it can do aren't that fantastic compared to what you can do for a fraction of the price. Technology is moving so fast that soon you'll be able to sample for five minutes on a home computer. There's always a good and a bad side to technology.”

SUBSEQUENTLY LEER AND Brücken formed Act as an experiment, and discovered a comfortable working relationship, sharing the writing credits.

“In the beginning we were feeling our way around and we stuck to what we knew - me being the musician and Claudia the vocalist”, Leer begins. “But as we've become more comfortable working with each other, we've started to interfere with each other's ground. We try to combine all sorts of elements in writing, like showbiz mixed in with dance music, jazz, pop and disco. And Claudia is also learning piano now.”

Act's main producer, Steve Lipson, came across as a rather pessimistic character when last interviewed in Music Technology (May '87), seemingly disillusioned with popular music. So what is he like to work with, 18 months on?

“He can actually drag you down, make you feel no good”, begins Brücken. “He's a complete perfectionist and the sound is everything. But being such a perfectionist can take some of the freshness away. I think if you want to compare his production with ours you should listen to the 12-inch of 'Chance' - Steve's version is very rock'n'roll America, very MOR.”

“The thing about Steve is that he's a brilliant techno man”, continues Leer. “If you want to use the best of the technology, like Synclaviers and Fairlights, you really can't get any better than him. He is brilliant at what he does, so he was worthwhile to work with.”

In the light of the success of the Stock, Aitken and Waterman production triumvirate, Leer concedes that the Horn/Lipson style of production is three years out of date, but the duo deny that it's a source of concern.

“'Doctor Mabuse' [Propaganda's debut] was done over three months”, asserts Brücken. “It's a fantastic piece and I wouldn't say anything against it. It's joyful and brilliant for the ears, but you don't need to do that anymore. I think you should use part of the demo because of its instantaneousness.”



Leer takes up the story: “An Act production means everything is done very quickly. I program everything musically before we go in, on the Voyetra. Then we lay it all down on tape in one go, making sure we have brilliant engineers so that it sounds great. Then we work really hard on the vocals, do a few overdubs, and go for a really good mix.”

“What you get from that is a kind of spontaneous spirit. With Steve it's 'Oh, let's offset this a tiny bit, and the feel will be that little bit different'. He needs you to be there because you are the writer and he needs to know what you think. But it's so boring - I don't work like that, and that's where the problem lay for me.”

But is Lipson good to work with?

Leer: “Everybody is up to a point. I'm a difficult bastard to work with apparently, so I don't really get on with producers. I've got too many specific ideas of my own.” ▶

► "You have to trust the person you work with," Brücken concludes. "I would hate being in the studio when all of the programming's going on, it's so boring. I know Steve is technically very good, so I trust him in that way, but I think maybe it's time now for a new experience."

Both Thomas Leer and Claudia Brücken have home studio setups, although Brücken's is at an early stage in its development. Having lost his Fairlight, Leer has had to settle for a less elaborate, though still useful, personal system. He now owns an Amstrad PC running Voyetra Sequencer Plus software, linking it up to an Akai S900, Yamaha DX7 and Roland Jupiter 6 - the only surviving keyboard from his 1984 line-up. Meanwhile, Brücken manages with an acoustic

88', the B-side of 'Chance'. The idea for that was to try to make something that was like a four minute medley of TV commercials. I started by sampling as many suitable things from television as I could. Then, once I had them, I set up loads of programs on the Akai and on the Amstrad. I put it together like a jigsaw around a bassline and drum part, with about five program changes to accommodate everything."

Does the question of sampling morality concern Act? It seems we have a difference of opinion here.

Brücken: "I can't stand it personally. I can't believe that people get away with it - I think it's a complete con. On 'Winner 88' we did some acoustic sampling. That's where you actually



"I wouldn't mind anybody sampling my records at all, but I think it depends how creative you are with it - most of the rapping and hip hop I hear is just rubbish."

piano, four-track cassette machine and Yamaha SPX90 multi-effects processor.

"When I get my proper equipment set up, I'm going to give her my old Roland MSQ700 and my Jupiter", says Leer, obviously in a generous mood. "Then we can both write at home and just bring the sequencers in.

"When I first got the Voyetra Sequencer, I hated it. On the Fairlight you can loop around for ages, but on the Voyetra you are unable to - it's much more like a recorder. It took me a long time to get used to that, but now I have done it I love it. It's probably the best of the new breed of sequencers. You can get right into the heart of the thing and magnify it all. And Steve's got one as well, which means I have been able to give him a disk to copy while I've got on with working on something else."

SO MUCH FOR the technicalities, what about writing the material?

"I usually start with the drums and then add the bass", explains Leer. "The drum sounds can vary - lately I've been using a Roland TR626, but the sounds aren't particularly brilliant on that, so I supplement it with samples from the Akai. The way I write can vary from song to song. Sometimes the chords will all be there in my head, and I'll sit down at the keyboard and pick them out - building the rhythm around them. Other times I will just be looking for inspiration, so I'll start with a rhythm part and fiddle around until something starts happening. Then again, sometimes Claudia will give me the completed lyrics, and they'll trigger off a rhythmic or melodic idea."

Leer has found the S900 a valuable tool since the loss of his Fairlight.

"I've got a library that I've built up, but the last track I sampled for extensively was 'Winner



sing the line for yourself which is actually quite funny. But I think that if it's ten tracks getting ripped off in a song and somebody becomes Top ten it's dodgy."

Leer: "I wouldn't mind anybody sampling my records at all, but I think it depends how creative you are with it - most of the rapping and hip hop I hear is just rubbish.

"To take a little bit of a James Brown rhythm and build a completely new song is great - some people have done that and it's good. But then when somebody has done it, and done it well, everybody else starts to do it. It's like regurgitation, because they steal the bit that was stolen, and that's just boring."

Could the popularisation of sampling, or even of technology as a whole, be the cause of this stagnation?

"Technology's killed music and it's killed creativity in a lot of ways" replies Leer. "People don't care about playing any longer. They're only concerned with the end product. The good side is that people who would have been unable to create before due to lack of technique, can now sit there doing things which would have been beyond their capabilities. It's a really difficult subject matter. Sometimes I'd like to just dump all technology and go back to all acoustic instruments. Do it for real."

All this from a man who claims to be self-taught and with a reputation based on using the best equipment available. It seems that Leer too is suffering from a degree of disillusionment with the current music scene.

As musicians moving with the development of domestic audio system technology, Act are interested in the continuing development of Compact Disc and Digital Audio Tape.

Leer: "DAT will be very important, but I don't know if recordable CDs will replace it. People like the idea of a cassette going into a tape machine for some reason - I certainly do. If the

record companies stop you from recording CDs it will destroy the whole point in a way. CD, I think, will move increasingly into the territory of a computer storage medium, while DAT will be entertainment based, and double up as a creative tool. I think, ultimately, that all those things like Copycode are a pointless waste of time. I think the facility of being able to copy things just makes people want to buy more machines, and the only effect of stopping copying is to confine people into one format. If copying is allowed, people will buy more equipment. Sony have obviously got that sussed because they make everything."

Act's new single 'Chance' is all about 1988 - they see it as a magical year, full of opportunity. The song is all about go-getters, yet according to Leer, it is an "anti-yuppie" record. They admit to mutual admiration for David Byrne and Brian Eno, and have already decided who they would now like to work with, although for the present their lips are sealed. ("He's quite an unusual choice, so we can't name him.")

Reflecting on their current situation, and planning their future together, Act are already beginning to work on the follow-up to *Laughter, Tears and Rage*. It seems they intend to adopt a more commercial approach than they did for their debut album.

"The first album was kind of experimental", Brücken explains, "because Thomas and I didn't know what our abilities could be together. We came up with some surprise tracks we were really chuffed with and which we didn't expect we could write together. Now we know what we are about and what we want, and having covered the showbiz angle, we would really like to go for

the Hollywood/Las Vegas feel."

"That's the fun of it, that's what keeps it exciting," Leer adds. "It's always constantly searching for something new. As long as we can continue to do that, we can work together. If we can't do that we will have to look for something else. I think it's important that people hear the album before they make their minds up, then they will have seen Act as a whole. Actually, this is the problem of the present day pop scene - most bands tend not to be seen as a whole any more, they are whatever the single is that's out at the moment. That's a pity because I enjoyed the days when you could get into the whole package, and that's what we are trying to present. You have to see the whole package to really appreciate it. The real pain is that you need hit singles to promote your album, and that's a real disaster."

Brücken takes up the cause, "Our songs are more complicated than some of the ones that make it to No. 1. Fairground Attraction made it to No. 1 because people like nursery rhymes. I think we're probably just a bit too mature for the singles market, but we're not panicking because we would rather build up a following that grows up with us."

And that, as they say, is the Act manifesto. Incidentally, Fairground Attraction supported Act at their London date in February. Is there any sense of frustration in that the support band made it to No. 1 first? Brücken seems none too happy.

"Don't talk about that. It happened with Then Jericho and Propaganda as well."

Anyone interested in the support slot for the next Act tour? ■

"The future for both the Fairlight and the Synclavier is bleak - technology is moving so fast that soon you'll be able to sample for five minutes on a home computer."



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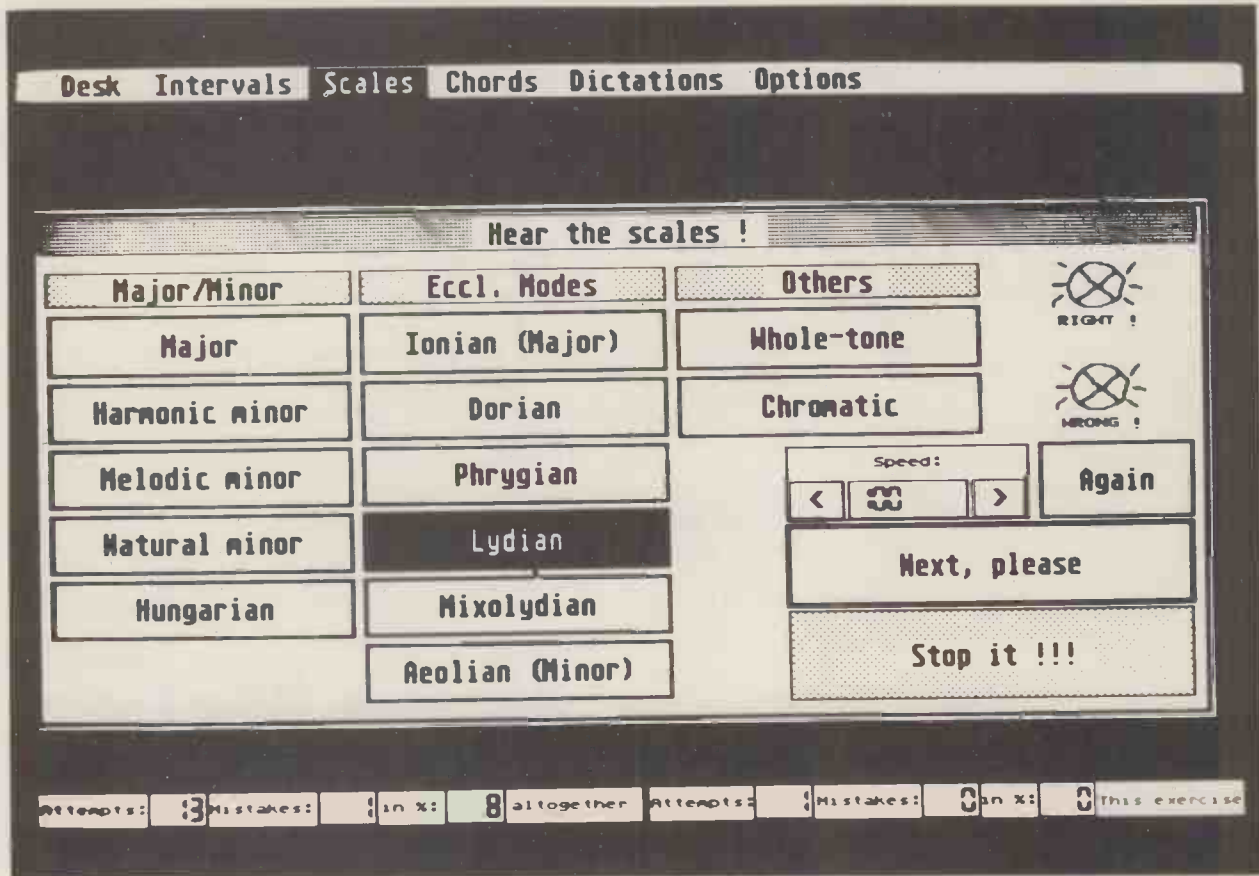
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STEINBERG'S THE EAR

Aural Training Software for Atari ST



Photography Adam Jones

As a useful alternative to training your ear to distinguish between synthesised and sampled strings you could train it to distinguish a Dorian from a Mixolydian mode

Review by Simon Trask.

AMONG THE AVALANCHE of MIDI software which threatens to engulf us nowadays, there's an area which the software houses seem to have forgotten (or perhaps not even considered). You may be able to compose 64-track sequences, put them through a sophisticated algorithmic process and print out the results in music notation. You may be able to edit synth patches and samples with great precision, and juggle patch libraries with great dexterity. You may be able to record your music digitally and cut it up as if razor blades were a thing of the past. And you may be able to record every nuance of a 24-track mixdown and fine-tune it at a later date. These processes are all available as part and parcel of late '80s music-making.

Yet, compared to the above categories of software, there's precious little software which actually *educates* you in music. Even scorewriting packages tend to assume that you know your quavers from your crotchets.

The potential is there to base music education around its natural medium of sound, rather than around the medium of the printed page. The potential is there to develop a highly interactive approach to music education, with the computer acting as teacher and being able to adjust its teaching to suit your particular strengths and weaknesses.

Overview

BY NOW, STEINBERG'S The Ear would probably be cowering in a corner if software could do such a thing. Why? Well, it isn't going to shake the educational world to its foundations, but then it isn't intended to. Well, what do you expect for 50 quid?

As you might guess from its name, The Ear is an aural training program – and I don't mean it teaches you the best way to clean your teeth. For those of you in the dark, aural training involves learning to recognise and name intervals, scales and chords, and, by extension, melodies and chord sequences – by ear. It's a skill which can benefit any musician, yet usually it's taught only as part of an academic music training.

Steinberg's program is very easy to use. You can all but do away with the manual, which is probably a good thing in this case ('nuff said, m'lud). The first thing you must do is click on the OHR.ENG file icon – if you click on OHR.DT, you'll end up with the German language version of the program. When the program loads, you're presented with a "good luck" message.

In true WIMP fashion, you call up windows by clicking

on various options found in the pull-down menus. Across the top of the screen are five menu headers: Desk, Intervals, Scales, Chords, Dictation and Options. Steinberg have forgone the ST's internal sound chip for playback; instead you'll need to hook up a MIDI keyboard and set it to receive on MIDI channel one (or in Omni on mode). You should also select a clean-pitched sound such as acoustic piano (no sense in making life unnecessarily difficult, is there?). The software will now play musical intervals, scales, chords and melodies on your MIDI instrument, wait for you to choose the right answers (or the wrong ones, as the case may be) and keep a score of the results. Your score for the current exercise and your total score are displayed at all times along the bottom row of the screen.

Clicking on "Info and Quit" (on the Desk menu) pops up a window prompting you to click on "I want to go on" or "I hear pretty good, QUIT!!!!". Assuming that you want to go on (after all, you've just shelled out £50 for the privilege), you can advance to the next menu, which is Intervals.

Intervals

THIS SECTION OF the program provides you with a choice of three tests: Big-small, Successive Notes or Concurrent Notes.

Big-small plays two intervals and expects you to say which is the bigger of the two. You do this by clicking on First Interval, Second Interval or None boxes, at which point the program will highlight the correct box. Click on "Next pair, please" and the program will play you the next pair of intervals.

You also have the option to hear the intervals as many

times as you want before making your choice. If you want to make life more difficult for yourself, you can specify in the Preferences window (under the Options menu) the number of repeats allowed before the program marks you down as a failure and progresses to the next pair of intervals. Finally, if you can't take any more, clicking on the "Stop It!!!" box will return you to the main screen (this is a feature of all the exercises).

The other two interval exercises ask you to identify single intervals. The entire range of possible intervals is

Scales: "The Ear might not be on a par with Slonimsky's famous thesaurus, but gives you major, harmonic, melodic and natural minor, church modes, Hungarian, chromatic and whole-tone."

covered, and in fact if you want to make life more difficult for yourself you can specify that the intervals range over anything from one to six octaves. As with Big-small, you click on the correct box and the program highlights the right answer and clocks up a success or failure on the scorecard appropriately. Again, you can listen to an interval more than once before giving your response.

Scales

YOU WANT SCALES? You got 'em. The Ear might not be on a par with Nicholas Slonimsky's famous thesaurus of scales, but it will give you major, harmonic minor, melodic minor and natural minor, together with all the church modes (except, for some reason, the Locrian), Hungarian, chromatic and whole-tone. The clever dicks among you will know that the major scale is the same as the Ionian mode and the natural minor scale is the same as the

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► Aeolian mode. Fortunately, The Ear knows this as well.

The program plays a scale for you (rising and then falling) at a user-definable tempo and then waits for you to click on the correct scale-box. As with the intervals, you can request to hear the scale more than once before committing yourself.

Chords

FROM THE CHORDS menu you can select either triads or four- and five-note chords, in both cases with or without inversions. Useful additional features allow you to choose whether or not the lowest note will be accented and/or shifted down an octave – the idea being to make

click on the correct box – and yet again you can ask to hear the chord more than once before making up your mind.

Random Melody Dictation

THE GOING REALLY gets tough here, because The Ear plays only atonal melodies – in other words, you've got no tonal reference points to work from.

Although the screen presents you with a piano score (which includes a rather unorthodox number of ledger lines between the treble and bass staves, incidentally), you can neither place notes on the staff using the mouse nor enter them from a MIDI keyboard. No, you'll have to get out the old pencil and manuscript paper, which seem a bit out of place when every other exercise allows you to tell the program what your answer is. Consequently, the only way The Ear can mark you down as a failure is if you ask to hear the melody more than the specified number of times.

To see if you've got the answer right, you click on the "Look at it!" box and the program writes the melody onto the staves. Incidentally, you're only dealing with pitches here, not rhythms.

Finally, you do get some control over the difficulty of the exercise, through being able to specify the tempo (40-280bpm), the note range (from 7-30 semitones) and the number of notes (8-20).

Preferences and Score

FROM THE OPTIONS menu you can call up the Preferences window. This allows you to set such parameters as the note range for the exercises, the duration of the notes in the intervals and chords exercises (up to one second), the number of times you can listen to each interval, scale or chord before you're marked down as a failure, and the velocity level for the accented note in each chord.

These parameters, together with others set in the individual exercises, can be saved as a setup file to disk for subsequent recall. Finally, you can display and print out a list of scores for every exercise, and clear the score table when you wish to start afresh.

Verdict

BEGINNERS BEWARE: THE Ear is not a structured learning program. I can't help feeling that anyone starting from scratch would feel as if they'd been thrown in at the deep end and left to sink or swim. Although you can vary the difficulty of the exercises to a modest extent, I don't think any of the exercises are pitched (so to speak) at a simple enough level for the beginner. For instance, why not have an intervals exercise where all the intervals are played on the same root note? And why not have a tonal melody dictation option?

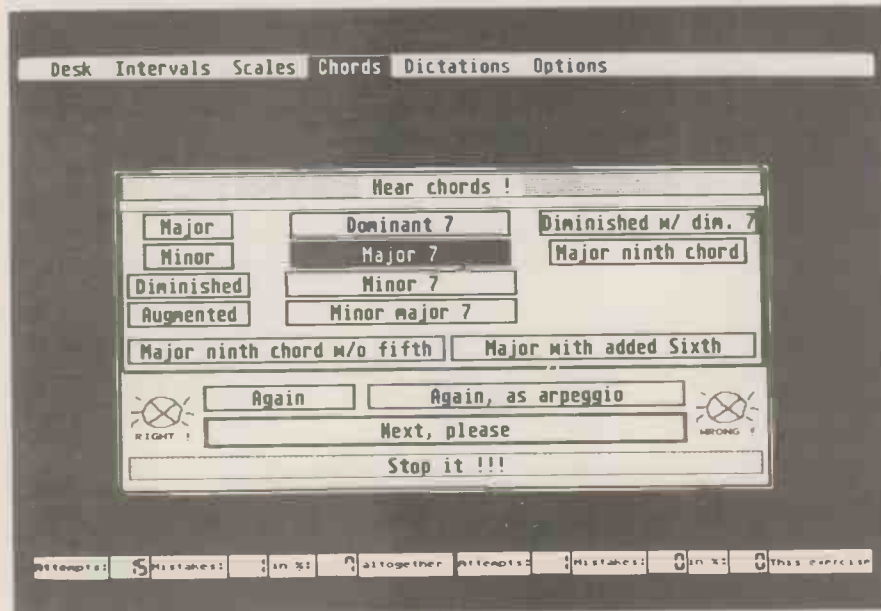
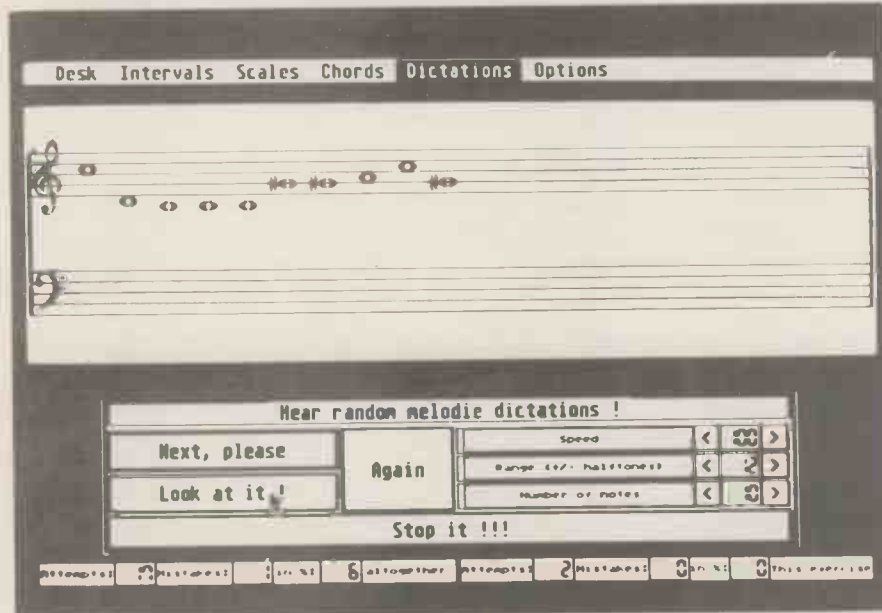
A rather silly design shortcoming, which seems to run counter to the aims of the program, is that you can't click on intervals, scales or chords and listen to what they sound like. You always have to take them in the (random) order that the software provides them.

But it's certainly not all bad news. Overall The Ear is a good program, with the advantage that it isn't so simple that you'll outgrow it after a short while. What's more, the exercises are valuable for keeping educated ears on their toes (if you see what I mean).

Maybe I'm expecting too much of The Ear, but aural training software could offer much more than Steinberg's program provides. ■

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identification of the lowest note easier, particularly for inversions.

The triads you get are major, minor, augmented and diminished, while the range of four- and five-note chords is necessarily more extensive but not comprehensive. How do you fancy recognising dominant, major, minor, minor/major and diminished 7ths, major 9ths (with and without the 5th) and a major triad with added 6th?

Chords are really an extension of the intervals exercises, and again the idea is to learn what a particular chord sounds like. As an aid to hearing which notes make up a chord you can ask The Ear to arpeggiate the chord for you.

Once the program has played a chord for you, you must

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Sample Expanders

If the art of sampling doesn't appeal to you – or you're just looking for a shortcut to sampling excellence – Kurzweil's 1000 series modules could be for you.

*Review by
Simon Trask.*

KURZWEIL HAVE TRADITIONALLY had a reputation for being to sampled instruments what Oberheim are to synthesisers. We're talking Rolls Royce category here, with prices to match – the company's most famous instrument, the K250, weighs in at around a cool £10,000.

At the budget end of the market (for Kurzweil) the company produce the 1000 Series sample modules: the K1000 keyboard and 1000PX, 1000GX, 1000HX and 1000SX modules. While the first two provide a variety of instrumental sounds, the latter three are each dedicated to a specific "family" of instruments – guitars, horns and strings respectively. Essentially it is only the source samples which make each instrument different.

The 1000's sounds can respond to attack and release velocity, and to channel and polyphonic aftertouch. For added responsiveness you can select from a range of preset velocity maps or create your own. Kurzweil also allow you to define receive and transmit Program maps, so that, for instance, a received patch number 22 could call up Program 147 which would transmit patch number 63. It's a neat way of being able to align patches musically without having to align them in memory (particularly as the 1000s have more patches than MIDI has patch numbers).

The GX, HX and SX are each 20-note polyphonic, while

the PX and the K1000 are each 24-note polyphonic. What's more, if you find that this many voices isn't enough, you can use a function called MIDI Chain Link. This allows you to chain up to twelve 1000s together for, in the case of the PX, a maximum 288-note polyphony. Chain Link seems to work in much the same way as Group mode on Oberheim's Matrix 1000 (see review elsewhere in this issue), in that notes are rotated through the twelve (or however many) units.

Front-panel operation is simple and quick, adopting the increasingly popular "generic" approach, whereby you use a minimum of dedicated buttons and step through an open-ended number of display pages. In this way manufacturers aren't limited by the physical "front end" should they wish to bring out software updates.

Layers, Programs & Modules

THE SONIC BASIS of the 1000 is its Soundfiles – multisamples. There are 26 of these on the SX and 59 on the HX. Primarily they are of acoustic instruments, but Kurzweil have also included a sine wave and a few synthetic sounds.

Up to four Soundfiles can be combined in four Layers to create a Program, of which there are 163 in the HX and 184 in the SX. In each case 64 (numbers 64-127) are RAM and therefore user-programmable, while the rest are ROM presets (which you can of course copy into RAM if you want to tinker with them).

In addition to a Soundfile, each Layer in a Program can be given its own values for volume, balance sensitivity (positive/negative), MIDI key range, transposition, detune, delay, dynamic range and (my favourite) keyboard tilt. The latter parameter has nothing to do with how much alcohol either you or your keyboard might have consumed, but rather allows you to assign a progressive change in volume across the keyboard range. Delays can be anything from one millisecond to ten seconds, so it's easy to set up all manner of delay effects using either the same sound or up to four different sounds. Additionally you can define whether or not MIDI data such as sustain and sostenuto pedals, pitch-bend, volume and velocity will affect each Layer.

The 1000 also allows you to program a digital Effect for each Layer. The 1000 utilises two Effects levels, Compiled and Modular, which are mutually exclusive per Layer. The former allows you to select from 12 preset effect types such as vibrato, tremolo, Leslie, chorus, phaser and echo (but not reverb), all of which have parameters editable per RAM Program.

At this level, everything's fairly straightforward, but when you choose Modular effects you open up a whole new area of complexity. Rather like Oberheim with their Matrix series of synths, Kurzweil have tried to reproduce the flexibility of the old modular analogue synths by allowing you to connect up, in all manner of ways, a wide range of Modules such as local and global LFOs (with 22 waveforms to choose from, incidentally), local and global ASR Envelopes, Mixers, Inverters, Negators, uni- and bipolar variable-stage Envelopes, Envelope Control, Pitch Control and Amplitude Control. Some of these Modules can be given one control source, others two, and there are limits to how many of a particular Module you can assign to a Layer (typically a maximum of two).

As well as being able to set up all manner of modulation chains with these Modules, you can dynamically modulate the modulators using incoming MIDI commands such as controllers, attack and release velocities, channel and polyphonic aftertouch, and key number. For instance, you could use a global LFO to create a vibrato effect, then program the LFO's rate to be controlled by aftertouch via MIDI. MIDI commands can also be used to control volume balance per Layer, so that, for instance, with velocity controlling the balance of two Layers (one positive, one negative) you can create velocity crossfades.

The Compiled effects are in fact preset Module configurations created by Kurzweil's engineers. For instance, the Leslie effect has been created by having one global LFO modulate pitch and amplitude controllers for Layer one, and another global LFO modulate pitch and amplitude controllers for Layer two, with both LFOs being modulated by channel aftertouch for good measure (though you could just as readily choose another MIDI source such as the mod wheel).

Of course, all this modular power can be used to produce some weird sounds (and on the HX and SX it is), but applied with more subtlety it can be useful for generating a natural and dynamic "breathing" quality in the samples.

The Sounds

SOURCE SAMPLES IN the SX include bowed strings, violin, cello, pizzicato strings, mellow strings, bright strings,

very bright strings, mellow cello (really) and synth strings. Viola and double bass are notable through their absence, however.

Because the 1000's sounds are multisampled, some Soundfiles include split textures, such as solo cello and solo violin (obviously the splitpoint is fixed). Many of the basic sounds have mellow/bright variations, and though the difference is more than that of opening or closing a filter, they do help compensate for a surprising omission on the 1000s: filtering.

The SX provides a healthy variety of ensemble-string and solo-string Programs. Among the single-Layer Programs, 'Bowed Strings' (01) is a full-sounding string ensemble, while 'Solo Violin' (02) has a lyrical, warm tone and catches the bow scrape well, 'Solo Cello' (03) has a rich, woody, stately quality, 'Pizzicato Strings' (04) has a dynamic, bouncy quality and captures the unevenness of a string section pizzicato effectively, and the slow attack of 'Slow Strings' (05) removes the percussive wood scrape of 'Bowed Strings' to produce a more stately sound. The SX is quite capable of providing large orchestral string sounds without having to resort to layering.

Programs employing more than one Layer include 'Strings SI Octave' (12), which combines bowed strings and bright strings at various octave transpositions to create an expansive string-orchestra sound, and 'Hard Attack Strings', which layers staccato solo violin with bowed strings - staccato playing producing the solo violin only, and legato playing bringing in sustained strings.

To my mind the synthesised sounds in the upper Programs (such as synth strings, synth pizzicato, synth bass,



electric piano and harpsichord) are not this expander's strong point, coming across as make-do substitutes in the absence of any better alternatives. Still, you have to take your hat off to Program 162, 'Killer Bees' (on second thoughts, perhaps not), which uses vibrato and delay vibrato Compiled effects on layered mellow strings, bright strings, very bright strings and bowed strings to very good effect. Besides, listening to a swarm of killer bees humming a B13#11 chord is quite something.

As with the SX, the horn expander provides a good ►

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► selection of multisampled instruments, though like the SX there are some surprising omissions. Why is the saxophone only represented by the tenor variety (I like my plaintive sopranos and gruff baritones)? Still, you do get a number of excellent trumpet, muted trumpet, trombone and tenor sax samples, and as with the SX you get all shades ranging from mellow to very bright (the tenor sax even manages a growl or two). And just for variety, the bizarrely-named 'Alien Growl' sounds like someone squawking through a sax mouthpiece.

Of the Programs, 'Soft Tenor Sax' (04) has to be a highlight of the HX. Maybe it's not exactly Ben Webster, but it definitely captures something of his seductive, breathy tone. Very expressive. 'Dual Tenor Sax' (07) employs velocity-switching between medium and growl tenor saxes, so you can be mellow or aggressive as the inspiration takes you. 'Solo Trumpet' (01) and 'Solo Trombone' (03) are both extremely good samples of the real thing, while 'Trumpet Mute' (02) somehow doesn't sound quite fragile enough.

The HX also has plenty of ensemble Programs produced by layering various versions of the same instrument or several different instruments. For instance, 'Sax Trio 2' (36) layers "soft", "mellow medium" and "mellow soft" tenor saxes, while 'Brass Section 2' (41) layers "mellow muted" trumpet, "mellow" trombone and "mellow" trumpet.

The HX contains more synthesised sounds than its strings counterpart, including several electric pianos, synth bass and synth marimba. To my mind these aren't the expander's strongest points by any means, and it's a shame they're presets. 'Harpichord 1' (151) purports to make a harpichord sound out of a mellow synthesised trumpet. It doesn't succeed too well. However, 'Harpichord 3' (153) fares better with layered "muted" trumpet, "medium tenor" sax, "mellow muted" trumpet and "mellow" trumpet. It's true, I tell you. Finally, 'Program Z' (that's its name) finds Kurzweil distorting the hell out of 'Alien Mutant' (a pretty distorted sound already) in an attempt to show off the extremes of the HX's modulation possibilities. The result sounds like the TARDIS on a bad day.

The Full Picture

BEYOND THEIR SOUNDS, what really makes the 1000 Series instruments so attractive is their implementation of Multi mode. This allows you to assign a single Program (which, remember, can consist of up to four multisampled sounds organised in any fashion across the keyboard) to each of the 16 available MIDI channels. In this context, each selected Program has independent MIDI response. Obviously, with the range of horn and string sounds contained in the HX and SX respectively, you can build up horn ensembles and string ensembles quite easily – while the more varied combination of sounds in the K1000 and 1000PX provide much more varied ensemble possibilities. Ultimately, of course, there's still a limit to the polyphony available (unless you've got lots of money to pass Kurzweil's way, that is), even if these expanders do offer more voices than virtually every other sampler or synth available.

Surprisingly, there's no way of storing more than one multi-channel configuration. Another surprise – even more so when you consider these expanders will primarily be used by professional studios and musicians – is that, despite being able to play up to 16 different sounds at once, the 1000s only sport stereo outputs.

Fans of weird and wonderful tunings should be kept happy by the 1000's 17 Intonation Tables, which in addition

to equal temperament provide such delights as just intonation with flattened 7th, 1/5th comma, Indian Raga, Bali Java, Pythagorean with augmented 4th, and Carlos Alpha (I kid you not). If you can't find a tuning that's to your liking, you can always create your own (as cent variations within individual semitones of the octave).

For people who want to have some idea of what's being pumped into their 1000, Kurzweil have included a MIDI analysis routine which allows you to monitor incoming MIDI data in an interpreted form. This tells you what data is being received, on what channel(s) it's being received, and how long (in milliseconds) since the last byte of data was received.

MIDI is also the only means (using SysEx) of storing off your carefully-crafted Programs once you've used up those 64 RAM memories. As well as Programs, you can store velocity maps, MIDI Program maps and intonation tables.

"The MIDI Chain Link facility allows you to chain up to twelve 1000 modules together for, in the case of the PX, a maximum 288-note polyphony."

SysEx addressing of multiple 1000s is no problem, as you can assign each expander its own device number. Kurzweil have developed a program called ObjectMover which facilitates storage of 1000 Programs and related features. It's available for the Mac, while an ST version is forthcoming.

Verdict

KURZWEIL CLEARLY DESERVE their reputation as purveyors of quality instruments. Many of the sounds produced by these two expanders are among the best imitations of natural instruments that technology has to offer. In contrast, the synthetic sounds are not such a strong point, and seem to have arisen from an attempt to broaden the range of sounds provided by these dedicated "family" instruments.

Overall the sampled sounds are blessed with a real warmth and breadth which is hard to find elsewhere, while the modular versatility and multitimbral power of these instruments means they should purr along where other instruments might splutter.

To my mind, Korg's new M1 (reviewed last month) provides sampled sounds of equal excellence, though I'd say they have a clean, pure, "tight" quality which is in contrast to those of the HX and SX. The M1 also happens to be an extremely competent all-round instrument, with a much broader range of sounds, much better synthesised sounds, 44 clean-edged PCM drum samples, onboard sequencing and digital effects, four outputs – and, of course, a keyboard. It also has the ability to access new sets of source samples via plug-in PCM data cards, though it seems that Kurzweil are about to open out their 1000 Series instruments with new sets of samples which have to be fitted inside the instruments.

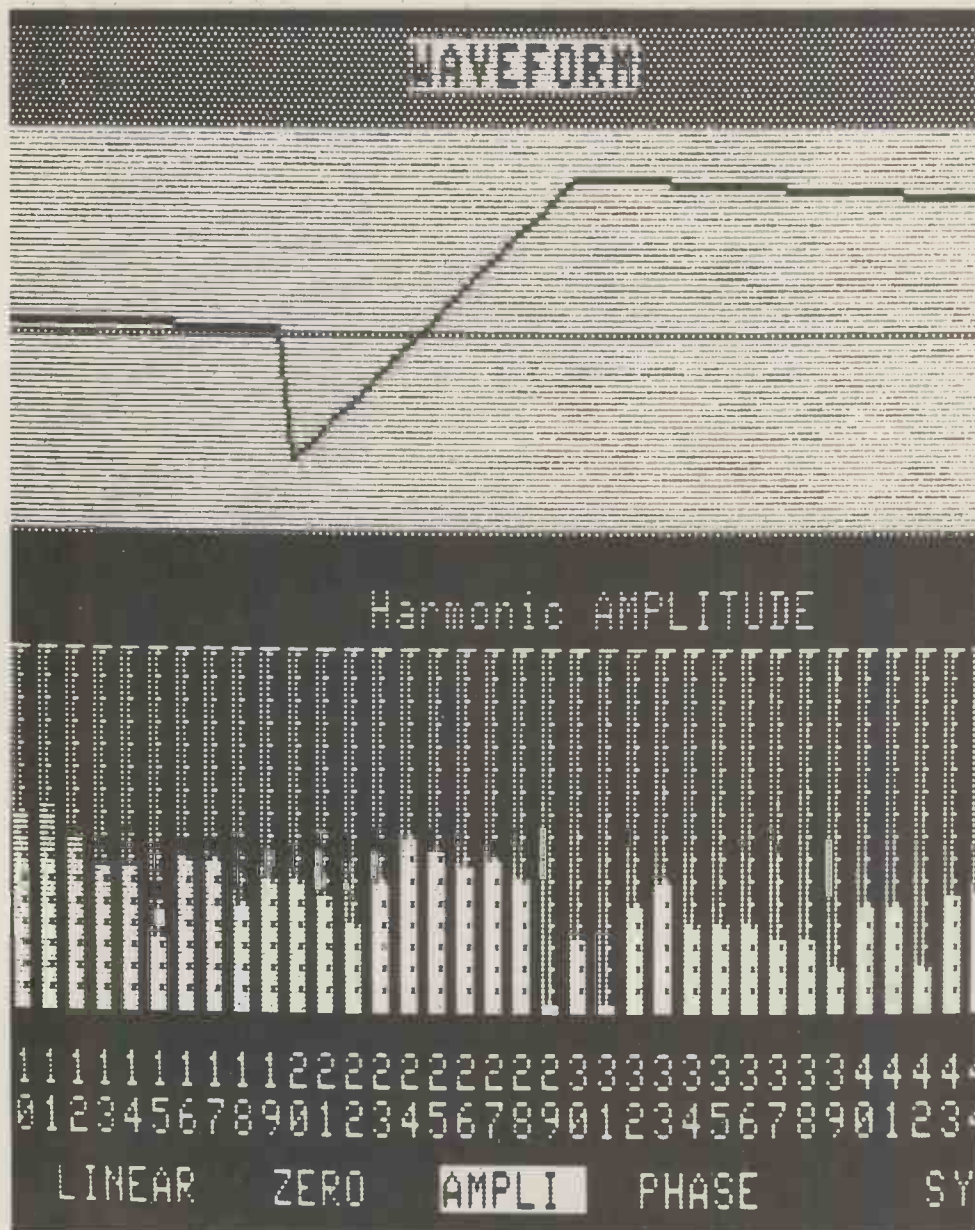
However, when all's said and done, the HX and SX are definitely worth checking out if you're looking for high-quality instruments which will fulfil a specific task with great musical and organisational competence. Definitely the professional's choice. ■

Thanks to Anthony G Morris of AGM Communications, Ely, for providing the review models.

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DIGITALLY *yours . . .*

You can't buy a piece of musical equipment these days without it claiming to be digital in some respect, but what does "digital" actually mean when it comes to sound? *Text by Peter Bergren.*



THERE'S SOMETHING RATHER special happening in the world of music and audio technology which you're probably already aware of – the appearance of equipment which allows direct passage of digitised audio information between one unit and another. So far these include digital mixers, equalisers, reverbs and various recording devices – including high-end units such as the AudioFrame and Fairlight III. These latter units can be properly called workstations, in that such functions as sampling, storage, sequencing, processing and other modifications all

take place within one unit, with all signals remaining in the digital realm. Digital audio connections allow a signal to stay in the digital realm when passing from one unit to another.

What's really exciting about this is that it's now possible (or soon will be) to assemble a system from separate components that will have at least some of the flexibility of a workstation, but for a lot less money.

Please understand, we're *not* talking about MIDI, which is really a coded set of commands, nor sound itself passing from

machine to machine. Instead we're talking about direct passage of digitised audio signals. A chief advantage of this is that keeping audio in digital format incurs none of the losses or distortion commonly associated with the conversion of analogue signals to digital and back again. To understand these problems, let's look at analogue processes.

Analogue

IN A WAY, you can never really "hear" anything because hearing is really a personal perception, rather than a direct experience. If the classic tree in the forest falls, there's a physical disturbance causing the air molecules to move, thus creating a sound wave. When we're in the forest and hear the tree, we're still several steps removed from having direct contact with the motions, actions and reactions of its fall. What we're really experiencing, is soundwaves against our eardrums.

In each stage of the hearing process, energy in a particular medium is translated into another form of energy in another medium. What is common to all these stages is the replication of energy changes (amplitude, polarity, time factors and so on). Unfortunately for the energy, the media themselves are in a constant state of flux (even if viewed over very small periods of time), and therefore have continuously changing characteristics. It follows that each energy transformation causes inaccuracies in translation, so that some of the original information will be lost, or spurious information added.

So, to take a stock definition of analogue: "something similar to something else". Hearing something from analogue tape is actually to hear an analogy of what really happened. To be fair, it's a close replication, offering a similarity to the real (I use the word loosely) thing, but there are going to be differences.

Analogue

IF SOUND IS an energy event that varies continuously with the passage of time, what's the most logical way to transmit it? Well, by some means that can be made to vary in a way that's similar to the soundwave. Alexander Graham Bell did this by varying the spacing (and thereby resistance) of carbon granules, thus modulating a current in sympathy with air

pressure changes. Edison made a permanent record of these changes by using sound pressure to cut a groove in a wax cylinder that was similar in contour to the fluctuation in air pressure occurring as he said "Mary had a little lamb".

But there are a host of problems involved in this kind of approach, many of which result in noise and distortion. Unfortunately, most noise sources (such as dust in a record groove or rumble from a turntable motor) have either a physical contour that varies continuously (such as the scratch in a record) or an electrical characteristic that does the same (such as white noise or radio interference). Systems sensitive to reception of the variations in sound waves are also receptive to the characteristics of noise sources. That's why you have to take care in handling your LPs, and also why companies make so much money on devices that can lower the noise level and increase the signal level in transmission, processing and recording systems.

But there's a limit to how high the signal level can be made. There's no way you can cut a groove in a record that's comparable to the amount of energy emanating from the falling tree. The physical limits of the media prohibit such high energy levels, just as low level noise sources compete with signals at the other end of the loudness scale. And when you consider that these problems accumulate with each copy you make, analogue methods don't seem such a good bet after all.

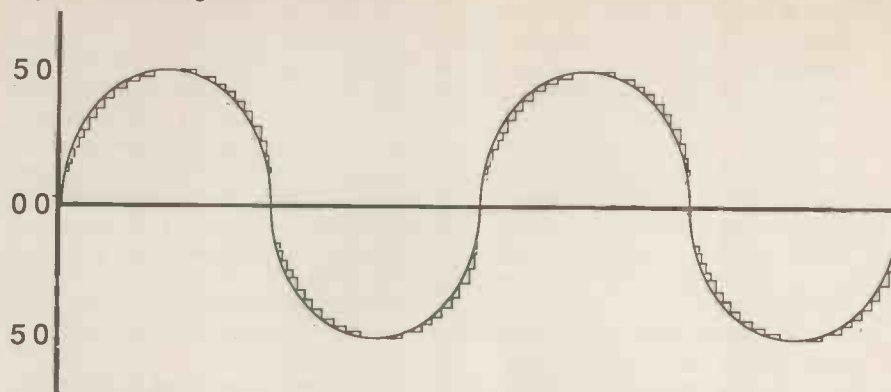
Digital Audio

INSTEAD OF RECORDING the continuous variations of a sound wave as changes in another medium, suppose we make a series of measurements of them at precise points in time? Then we can retrieve this information without analogue noise and distortion being recognised. This is precisely what digital systems do. They sample the analogue waveform many times a second and quantise each measurement made during a sample period, so that a stream of discrete, unambiguous numbers is the result - numbers which represent changes in the sound wave's amplitude and polarity over time.

Because each sample is a particular number, these numbers can be encoded in binary form - as 1s and 0s, or on and off pulses clocked at a consistently accurate rate. This scheme is ideally suited to digital transmission, storage, and manipulation. Analogue noise ends up being too low in level to register as 1s and 0s on its own (unless it's present at the input before the signal is digitised), and representing very loud sounds is simply a matter of generating larger numbers.

As the sound is now a stream of numbers, altering a number modifies the sound. Increasing a number - making the sound louder - is a matter of multiplication; decreasing one - for a lower sound level - is a matter of division. And as computers are great at maths, performing operations on a signal in the digital

Figure 1. Quantising a 100Hz sine wave.



domain introduces less distortion and noise than dealing with it in the analogue domain. Mathematical operations can be performed to produce the equivalent of filtering, EQ, mixing, reverb, pitch shifting, delay and their like - almost any analog process can be analysed and an algorithm (a program) devised which can then control the electronic hardware. Neeto, eh?

Sampling/Quantising

IMAGINE A PIECE of graph paper divided into 100 segments vertically, and 100 horizontally, with a horizontal line drawn across halfway down. The vertical scale represents 100 voltage divisions: 50 positive and 50 negative, with the halfway line being the zero voltage point. The complete scale represents one volt. The horizontal scale represents 1/100th of a second, divided into 100 parts.

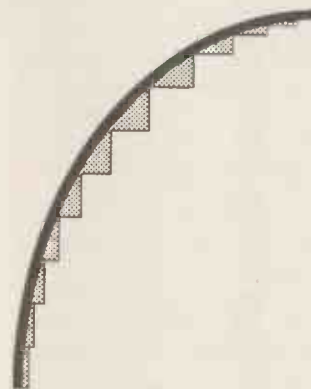
Now imagine one cycle of a 100Hz sine wave drawn on the graph paper, with its zero crossing exactly midway on the horizontal midline of the graph. (See Figure 1) Let's describe this waveform in numerical terms: base 10, decimal notation.

To do this you have to relate time to voltage, and come up with a "data stream." It's fairly easy, if rather tedious, to do this. Simply correlate each time value on the horizontal axis with its corresponding voltage value on the vertical axis, being careful to note the polarity of the voltage read-off. Read upwards from a time value to its intersection with the waveform, then across to the voltage level that comes the closest to also intersecting at the same point on the waveform. Note that time and voltage intersections don't always coincide exactly on the waveform line. Approximating this is called quantisation error.

When you're done you should have two columns of 100 numbers each, both starting with zero. The decimal representations of voltages can be relatively easily changed to binary notation, consisting of strings of 1s and 0s. Once in that form, they can be easily stored as pulses/no pulses on tape or disk, or conveyed by a wire, fibre optic cable or whatever.

Modern digital systems will sample at 44.1kHz, or 48kHz, and in a 16-bit linear format offer 65,536 measuring, or quantisation, increments. This large number is derived from allowing 16 bits to

Figure 2. How a sample and hold circuit breaks up a sine wave. Shaded gray area shows error.



form a byte, or word, describing a particular voltage measurement. Since each bit can have two states (on or off), and there are 16 of them, you have 2 to the 16th power, or 65,536. An 8-bit word by comparison is 2 to the 8th power, or 256 measuring increments. This disparity accounts for the considerable discrepancy in dynamic range between 16- and 8-bit systems.

Rapidly varying (high) frequencies and transients require more sampling intervals than low frequencies, and defining very loud against very soft sounds demands a wider range of numbers. Also, the more measuring increments you have available, the less likely it is that a small change in the analogue waveform will occur between two measurements, assuming also that the sampling periods coincide so as to catch the change. When a small change like this does occur, the bipolar nature of change in the analogue waveform is not represented by a change in the voltage levels recorded by the digital system, and distortion results, which will be reproduced unless certain measures are taken. More of these later.

It's important to realise that any analogue-to-digital (A/D) conversion is always subject to quantisation error, because you're trying to represent a continuously varying process with finite numbers. So how important is this error, especially at high frequencies where, for example, you would have roughly two samples (44.1kHz rate) taken within one cycle of a 20kHz waveform?

Sample and Hold

TAKING THE 100Hz wave in figure 1 as an example, let's imagine what happens ▶

► when it enters the sample and hold circuit of an A/D converter. This circuit is analogue, in that it creates a hybrid analogue waveform that consists of discrete voltage steps that rise and fall with the contour of the sampled waveform – like stairs going up and down a hill. The ratio of stair “riser” to “tread” measurements varies with how long a given voltage value remains constant for a given number of sampling periods. The stairs could be considered to be fairly symmetrical for a pure sine wave.

The sample/hold circuit forms this staircase by capturing the voltage in the waveform present at the beginning of each sample period and then holding this value until the next sample period. This hold function creates the “tread” in the stair step. At the next sample period, the value of the next held voltage changes, because the analogue waveform has itself changed value, continuously, between sample intervals. This change in voltage level to that captured and held during the last sample period creates the “riser” in the stair step. (See Figure 2)

The important point here is that the stair-step voltages more-or-less follow the contours of the waveform. More-or-less because quantisation errors are always present when the actual value of the waveform doesn't exactly coincide with a

contour they were rising and falling with.

In the case of a 20kHz sine wave, as long as it rises and falls within at least two sample periods and crosses at least two quantisation intervals, a square wave representation will be formed by the sample/hold circuit. By definition, this square wave will contain odd order harmonics higher in frequency than the sine wave it represents; but when it runs into the filter, the square wave will lose all harmonics that are odd order (180kHz, 9th harmonic; 140kHz, 7th harmonic and so on) and become the 20kHz sine wave it was meant to be.

If this sine wave is more complex and contains a harmonic ripple, this harmonic would be far too high to hear – and would be filtered out. It should be noted here that this filtering takes place at the system output, after the waveform time/voltage measurements stored in binary form have been reconstructed into a stair-step waveform. This filter is often called an “anti-imaging” filter, for it also removes high frequency multiples of the input waveform's frequency response curve (spectrum).

The more quantisation increments you have available, and the more samples taken per second, the more likely it is that the analogue waveform will fall on the intersection of a sample period and a

cross two quantisation increments instead of one. When the resulting data is recreated and filtered, the result is the original waveform sans distortion, but with a negligible amount of white noise added. This situation often occurs when the minute harmonic ripples riding on the larger excursions of a complex wave, don't quite cross from one quantisation increment to another between sample periods.

Aliasing

A FELLOW NAMED Nyquist came up with a very interesting theory, which he proved experimentally, and which has since come to be the basis of the design of all digital systems. Briefly, he said that the highest frequency for a digital sampling system must be at least half the sampling frequency. So if you want to record a 20kHz signal, your sample rate must be at least 40kHz. If you try to record any frequency higher than the 20kHz, the analogue-to-digital converter (ADC) will not be able to take two samples per cycle; meaning it won't be able to accurately show the bipolar nature of the waveform and its frequency.

Remember that two samples must be taken and two quantisations crossed to create a square wave (via sample/hold) of the same frequency as the wave sampled. Beyond this Nyquist Limit, the sampler will take samples of the rapidly varying amplitude of, say, a 30kHz waveform, but catch samples at points not really related to each cycle of this waveform. The result will be descending frequencies (“aliasing” frequencies, since the original is being represented as something else) which take the place of the original harmonics. (See Figures 3A and 3B)

For example, if S equals the sample rate of 48kHz, and F equals the 30kHz “defiant” harmonic you wish to capture, then $S-F$ equals the spurious harmonic added to the legitimate frequencies below the Nyquist Limit. In this case, you would suddenly find yourself with an 18kHz signal present at the input. This and other frequencies formed by similar interactions cause aliasing distortion in the audible signal. To avoid this, a filter with a flat bandpass and very sharp stop band is inserted ahead of all other elements in the digitising system. In some ways it's similar to the anti-imaging filter at the tail end of the chain, and it's usually called an anti-aliasing filter.

Fading Out

SO MUCH FOR a few of the, uh, “fundamentals”. Many of the terms here may be familiar to you from sampler or CD player specs. Perhaps they'll mean a bit more next time you meet them. If you're thirsty for more information try *Principles of Digital Audio* by Ken C Pohlman Howard (published by W Sams & Co) – the plot's a bit weak but the attention to detail is stunning.

It's a whole new digital world out there. ■

Figure 3A. Sampling a sine wave more than twice the sample rate . . .

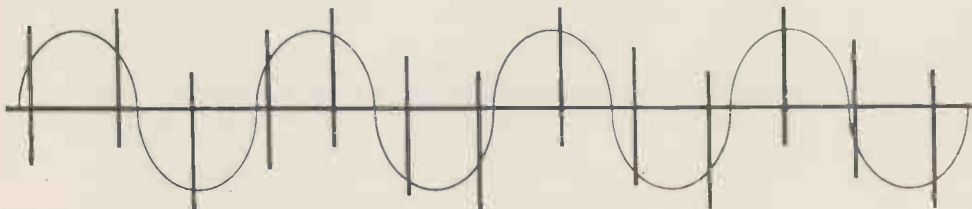


Figure 3B. . . results in an alias frequency lower than the original.



quantisation (measuring) increment at the start of each sample period. Nevertheless, the stair-step waveform can be decoded into an accurate recreation of the original waveform by filtering.

The stair treads really are a collection of square waves (or in some cases rectangular waves). As you may or may not know, square waves are formed when all the odd harmonics are combined. This can be thought of as a collection of sine waves starting upward from a given fundamental frequency (another sine wave). In our 100Hz waveform with an amplitude of one volt peak-to-peak, there would be 480 such square wave “treads” following the contour of each wavecycle, and 48,000 of them per second. This assumes we're now sampling at the 48kHz professional rate rather than the rate implied in our example with the graph paper. If we pass this stair-step wave through a filter with a stop band that cuts in at, say, 22kHz, all the stair-step components will be removed. What will be left will be the 100Hz sine wave whose

quantisation increment. Manufacturers have decided that a 44.1kHz sample rate and a 16-bit quantisation word are sufficient (for now – progress marches ever onward) to accurately encode and decode signals in the normal audio range. Large amplitude and complex signals relate randomly to any errors that are generated, and the errors, when reproduced at a digital system's analogue output, are low in level, resembling white noise. When the signal level being quantised/sampled drops, however, the errors become closer to these smaller excursions of the signal, for there are times when the signal's change in amplitude does not cross more than one quantisation increment.

For reasons too complex to describe here, this produces a nasty form of distortion known as “granulation noise”. One way around this is to introduce a small amount of white noise to the incoming signal, called “dither”. This is superimposed on the waveform, and effectively causes low level changes to

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VOCAL C·O·D·I·N·G



Illustration Sophie Lawrence-Jones

If you've always associated vocoders with tacky sci-fi robot voices rather than music you could be missing out on one of the most creative musical devices technology has yet produced. Text by Tom McLaughlin

THE VOCODER IS a most misunderstood beast. A hangover from the "prehistoric" analogue days, its mere mention conjures up images of alien and robot voice effects of dubious intelligibility. In a nutshell, the vocoder analyses the tonal qualities and loudness contour of one signal (the modulator) and superimposes them upon another signal (the carrier). But if you thought that the vocoder's use in life was restricted to making strange voice effects you've been missing the point of creative sound manipulation. Read on.

The earliest mention of the vocoder (from voice coder) I can find is 1948, preceding the voltage controlled synthesiser by almost two decades. In an attempt to minimise the amount of information needed to transmit speech down electric lines, the Bell Telephone Laboratory realised that speech could be

broken up into discrete frequency bands relating to vocal formants using filters.

Unlike modern analysis, synthesis and re-synthesis techniques, vocoder technology relies solely on detecting the amount of energy present in these predetermined frequency bands with good old analogue filters and envelope followers. The music and recording world actually owe quite a lot to communications technology, for in addition to the vocoder, equalisers came out of the concentrated analogue research in the '40s '50s and '60s.

The vocoder synthesises its speech by employing two identical sets of band-pass filters with centre frequencies matching key vocal formant bands. A voice signal is analysed and broken down into its constituent formant bands with the first set of band filters and re-constructed at the receiving end with the other set. A

vocoder greatly reduces the amount of information required to transmit speech down telephone lines. Thus the vocoder was born. It may come as a surprise, but the voice you hear on the other end of the telephone is often an analogue or digital real-time reconstruction.

Although a standard vocoder is limited to dealing with frequency bands important to speech (the EMS 2000 has two sets of 16 filters: low-pass 140Hz, band-pass 185, 270, 367, 444, 539, 653, 791, 958, 1161, 1406, 1703, 2064, 2700, 4000Hz and a high-pass starting at 5388 for sibilant and un-voiced sounds), it still has to be considered one of the most intelligent filter banks on the market. There are filter banks and programmable equalisers available with better technical specifications, especially in the signal-to-noise ratio department, and some can even string together and play back settings via MUSIC TECHNOLOGY AUGUST 1988

MIDI, but none of them can match the sheer versatility of the vocoder's ability to continuously track an incoming signal's frequency spectrum and superimpose that upon another signal in real time.

There are several types of vocoders still being made. EMS seem to be the most readily available and reckon they'll be producing their excellent vocoders (designed by Tim Orr) for many years to come. If not available immediately from stock, they'll manufacture any of their existing models, to specification if need be, in as little as a few weeks. I believe that Synton and AKG still make their vocoders but as far as I know these are only to order. The vocoder is far from dead, in fact Robin Wood of EMS UK assures me that extensive use of the vocoder was made in the recent Falklands war for scrambling top secret communications.

Roland, Korg, Moog and Bode made vocoders which you may still find floating around in secondhand columns, hire companies and universities. In its heyday, vocoder research led to some pretty hairy designs. The most complex vocoder EMS currently manufacture is their Vocoder 5000 with its two sets of 22 filters. In the late '60s David Cockerell and Peter Zinovieff came up with a system involving a 60-channel analysis/resynthesis section. Some, like the Roland Vocoder-Plus, were geared to the masses, having a simplified filter circuit and string synth intrinsic to its design. Roland couldn't have made it easier to get ethereal choirs, backing or harmony vocals: simply plug a microphone or recorded vocal in and follow the vocal line on the keyboard. Fine if that's all you wanted, but a true vocoder is capable of so very much more.

Recently two digital processors with vocoding modes have appeared, namely the Korg DVPI and Roland VP90 neither of which allow the flexibility of a true vocoder, and although fun to use and perfectly valid as specialised signal processors it is questionable whether these can actually be described as vocoders. It all depends what sort of effect you're looking for, the possibilities and permutations are vast, but vocoder use seems to fall into the following categories: creating synthetic speech effects, creating choirs and harmony vocals, making instruments sing, enhancing natural speech, altering a speaker's identity, correcting formants of sampled vocals, formant cross-modulation (voice scrambling), instrument cross-modulation, "impossible" vocal effects.

Synthetic Speech

EARLY USE OF the vocoder on tracks such as the Electric Light Orchestra's 'Mr Blue Sky' leaves a lot to be desired in the intelligibility department. This is understandable as the vocoder was probably hired in and, with hire and studio rates being what they are, insufficient time given to getting the most out of this unique form of signal processor.

Vocoders like working with sounds that have been optimised dynamically and spectrally. Feed them mediocre MUSIC TECHNOLOGY AUGUST 1988

modulator signals and no matter how good the carrier signal is, the end result will be mediocre. Medium to heavily compressed modulator vocals are in order here, with equalisation tweaked to make the voice as intelligible as possible (a favourite trick is to tweak a vocal, or mix, then listen to it from the next room. Success can be judged on the important elements still being present after making it through the walls).

Careful microphone technique is also important. Vocalists shouldn't be much closer than 6" from the microphone and should speak across, rather than into, the mic to prevent overloading the vocoder with plosive sounds. A pop-shield wouldn't go amiss, either. If there is considerable noise or ambience, judicious use of a noise gate will be of assistance.

Aural exciters may increase the intelligibility of non-vocoded vocals but tend to confuse vocoders when used to the extreme on modulator signals. With the exciters added top end high formants get shifted even higher and things like "V"s start sounding like "F"s. Best to use aural exciters in moderation on the modulator or, better still, on the carrier or vocoded output.

The standard procedure with vocoders has been to superimpose speech upon a wide spectrum carrier signal, typically an unfiltered or lightly filtered synthesiser tone or oscillator. The easiest effect to produce is the droning robot voice. Little work needs to be done to the carrier signal and it's as simple as finding the pitch, register and synthesiser tone colour suitable for the character of your "robot", putting that into the carrier input of a vocoder and speaking into a microphone sent to the modulator input. The result is the familiar monotone robot or alien voice.

But the carrier doesn't have to be a simple synth tone. As a matter of fact, your alien voice will be considerably more interesting if you use a combination of synth waveforms. Modular analogue synthesisers give a lot of scope for electronic effect source material. Complex LFO pitch and amplitude modulations, waveform cross-modulations and ring modulations can be set up so that what was once speech becomes nothing less than "out of this world". To help make fricatives and non-voices sounds (h-p-t-k-f-s) more intelligible, it is often necessary to mix in a small amount of high energy/high frequency sound material - traditionally white noise.

You'll find that your vocoded character will sound more natural if you vary the pitch of the character to mimic the inflections of human speech. Very few of us speak in a monotone (robots, aliens, and cyborgs excepted). Using a pitch-bend wheel is preferable to using a keyboard for varying the pitch of the carrier, the frequency animation characteristics of speech are rarely heard as discrete semitone steps. Take a good listen to yourself reciting a short poem and experiment with pitch-bending your synth to follow its natural fluctuations in pitch. In addition to allowing external carrier signals to be processed, EMS vocoders have an onboard oscillator that

may be used for the "voiced" portion of vocoded speech, and a circuit that may be used to vary the pitch of that oscillator according to the amplitude of the modulator in a most natural manner - speak softly and the oscillator will pitch itself lower, louder and its pitch will raise. Good thinking, Batman.

Harmonies and Choirs

EVEN THE SIMPLEST of vocoders makes giving the impression of a lead vocal backed by harmonies, backing vocals and choirs a breeze. The modulator may be a pre-recorded vocal track or a live source, and the carrier can be anything from a synth string or choir patch, sample library voices or even a sample of the actual lead vocalist.

Pulling the effect off requires painstaking attention to playing the carrier in time with the line to be vocoded and sensitive use of pitch-bend and vibrato. As with keyboard string sounds, slightly anticipating the entry of each note helps the illusion. Don't worry about hearing the carrier too soon. The brilliant thing about working with vocoders is that the carrier is gated by the modulator - even though it may still be playing, you won't hear the carrier if there is no signal present at the modulator input.

It's tempting to speed up the recording process by playing chords into your vocoder, but the realism of choirs and backing vocal ensembles will be increased if you overdub each chord's note as a separate line and track, each with a slightly different vibrato, tone colour and pitch bend. Careful EQ'ing and balancing of vocoded vocals in a mix completes the illusion.

To realistically vocode speech, it has been necessary to use either a very bright synth patch or mix in a noise source to give the vocoder something to work with for un-voiced or breathy speech components. With sampling now as readily available as synthesis there's no reason not to use sampled voices as carriers. Breathily vocal samples like 'Fairvoice' give the added benefit of already having a good amount of high-frequency material present. Using synthesisers as a carrier's raw material may have a lot to do with vocoders sounding overtly synthetic in the past. This need not be the case; any signal may be used as a carrier or modulator, as we'll see.

Making Instruments Sing

THIS IS AN effect that hasn't been used in quite a while. You have to remember that at its peak the vocoder was an industry buzz-word, much like the LinnDrum, AMS, sampling, SSL, and DX have been. Everybody and his brother were using them (not always tastefully) at one point and, inevitably, they suffered from overkill.

Instruments may be made to sing by playing the instrument and singing into the vocoder, singing live to a pre-recorded instrument track or playing to a taped vocal track. Musical skill is required: the vocoder is an instrument and to get ▶

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► the most out of it you have to practice using it. With a sync code on tape, modulators or carriers may be sequenced – this takes just as much skill as playing live. Emotive vocals require spot-on timing to follow convincingly.

Enhancing Speech

MORE COMPLEX VOCODERS like the Roland SVC 350 (11-band) and EMS 3000 (16-band) allow the user to adjust the amount by which specific formant bands are excited by the incoming modulator. Using the same voice signal as both modulator and carrier, deficiencies in the original signal can often be made up for.

I had occasion to use this technique on a series of samples made from a trans-Atlantic telephone messages left on an answering machine – you could just about make out what was being said. On top of that the production required that “the phone message be placed in an AMS reverb approximating a large airport”. Trying to make things more intelligible with an aural exciter only added to the already uncertain top end and, although equalisation helped, it wasn't the answer. Dusting off my trusty vocoder I found that compressing and EQ'ing the voice samples, and tweaking the formant band-pass filters on the vocoder helped them to sound more like the caller was phoning from around the corner rather than from across the sea.

The vocoder can also be used in a similar fashion to a de-esser, but with much more flexibility. Vocals suffering from over-sibilance can modulate themselves while rolling off a little bit of sensitivity on the upper formant filters to cut down on the offending “sssss”. Similarly, poppy “P”s and “B”s can be minimised by doing the same with the lower filters. Questionable vocal takes may be given a new lease of life. With attention to a good balance between the original and vocoder-corrected voice, you can often conceal the fact that any signal processor is being used at all.

Altering Identity

THIS IS FUN. Apart from thinking in terms of the vocoder as a speech synthesiser or specialised vocal equaliser, it may also be used to alter or mask the speaker's identity. Different formant bands can be accentuated, giving a voice another quality. The sex of the speaker can convincingly be changed by harmonising a split of the vocal to the desired register, then cross-modulating that with the original – anyone remember Will Powers?

Correcting Formants

THERE ARE MANY instances where use of the “palaeolithic” vocoder can help make vocal samples a bit more believable. As the major reason for munchkinisation is the shifting of a vocal sample's formants up the keyboard along with its pitch, we can use the vocoder to superimpose a MUSIC TECHNOLOGY AUGUST 1988

fixed set of formants on our vocal samples, adding considerably to their realism.

This is no more difficult than playing a vocal sample (the modulator) in a natural register, to sound the same note every time the sampled voices (the carrier) are played. You'll need to plan a keyboard map that sends the modulator to one output of your sampler and the carrier(s) to another. With sequencing, an extremely tight marriage of modulator and carrier signals is possible.

Some vocoders have Hold or Freeze facilities allowing their analysis and re-synthesis circuits to “hold onto” a sound at a given point in time. This has been useful in the past to superimpose “oo” and “aah” vocal sounds onto carriers but, like looping around single wave cycles of samples, one tone colour can become rather monotonous to listen to for any length of time. Now that we have the technology, it makes far more sense to use a sampled vowel sound as the modulator – offering all the animation of sampled sounds – along with proper formant registers and ratios.

Voice Scrambling

ONE OF THE earliest uses of the vocoder seems to have been in the post-war period by the US Navy. Messages could be sent down communications lines without the enemy having the slightest clue as to what was being said, by taking the values arrived at by the speech analysis section of a “modular” vocoder (such as Moog's and EMS' 5000) and swapping them around at the resynthesis input. This process is known as formant cross-modulation or Voice Scrambling and really does produce quite unidentifiable synthetic speech. I wonder what the result would sound like after locking someone away with one of these to use on an acid house mix?

Instrument Cross-modulation

I'VE SPENT MANY gleeful hours experimenting with sampled as well as synthesised sound sources. Believe me, dealing with even the most boring synth patches yields surprisingly musical results, giving them an almost digital, sampled quality far more interesting than layering the sounds upon one another. I'm not a great lover of standard FM sounds (except when layered with digital, analogue or sampled sounds), but the effect of modulating simple FM and analogue sounds by one another produces acoustic events that border on what you'd expect to hear coming from Synclaviers or Fairlights – and at a fraction of their prices.

Frequency spectrum and loudness envelopes of sampled acoustic events can be magically transferred to any synth or sampled sound you can dream of with a vocoder. The ‘Let's Dance’ snare (thanks David) envelope might control how we hear a steam burst, complete with sizzling ambience. A more realistic tone colour

and bow scrape can be added to synthesised strings using sampled strings as the modulator. Something as simple as a pitch-swept sine wave will impose amazing harmonic sweeps on your carrier – nifty means of adding animation to boring sounds or drawing one's attention away from tell-tale sample loops.

But a vocoder isn't limited to processing simple speech or sustained notes. Depending on whether its slew rate is fast enough, a vocoder can be used to superimpose or cross-modulate almost any acoustic event, even complex rhythmic patterns. Hip hop, house and

“At its peak the vocoder was an industry buzz-word – like AMS, SSL, and DX – everybody was using them and, inevitably, they suffered from overkill.”

high energy sampling fanatics take note that no-one has yet modulated a James Brown groove with, say, a Stevie Wonder riff. This could be a creative way around the use of copyrighted material.

Unexpected poly-rhythms and accent shifts crop up when modulating one rhythmic pattern with another, which may just prove musically useful to you. Modulating a very ambient, though rhythmically simple, drum pattern with a more complex pattern will have the effect of placing previously non-existent emphasis on the ambience for a kind of ghost or phantom drum sound. Spooky.

Mega-tight gated reverb effects are created as simply as vocoding the reverb return with the untreated drum and combining the two through a mixer. Try this with a slow slew rate to exaggerate the effect.

A most unusual effect can be obtained by modulating the reverbed, delayed or effected signal with the original or vice versa. This is virtually uncharted territory; if you're in search of new effects, make a point of checking this one out. Do somebody's brain in by vocoding a reversed copy of a sound or better still, a reverse reverb.

Impossible Vocal Effects

ANYTHING YOU CAN do on a keyboard, instrument or sequencer can be superimposed upon a vocal, including any conceivable variation of trill, arpeggio, glissando, portamento or intervals technically difficult to sing live.

Vocoders might not be an answer to all your problems (or lack of inspiration), and you'll get far more use out of a reverb unit, but there are definitely some amazing sounds and effects hidden away inside them – certainly enough to warrant a closer inspection now that multitrack recording gear, quality instruments, synthesisers and samplers are within many a muso's financial grasp. With a little bit of imagination and experimentation who knows what sort of sonic mind-benders may emerge from someone's bedroom? ■

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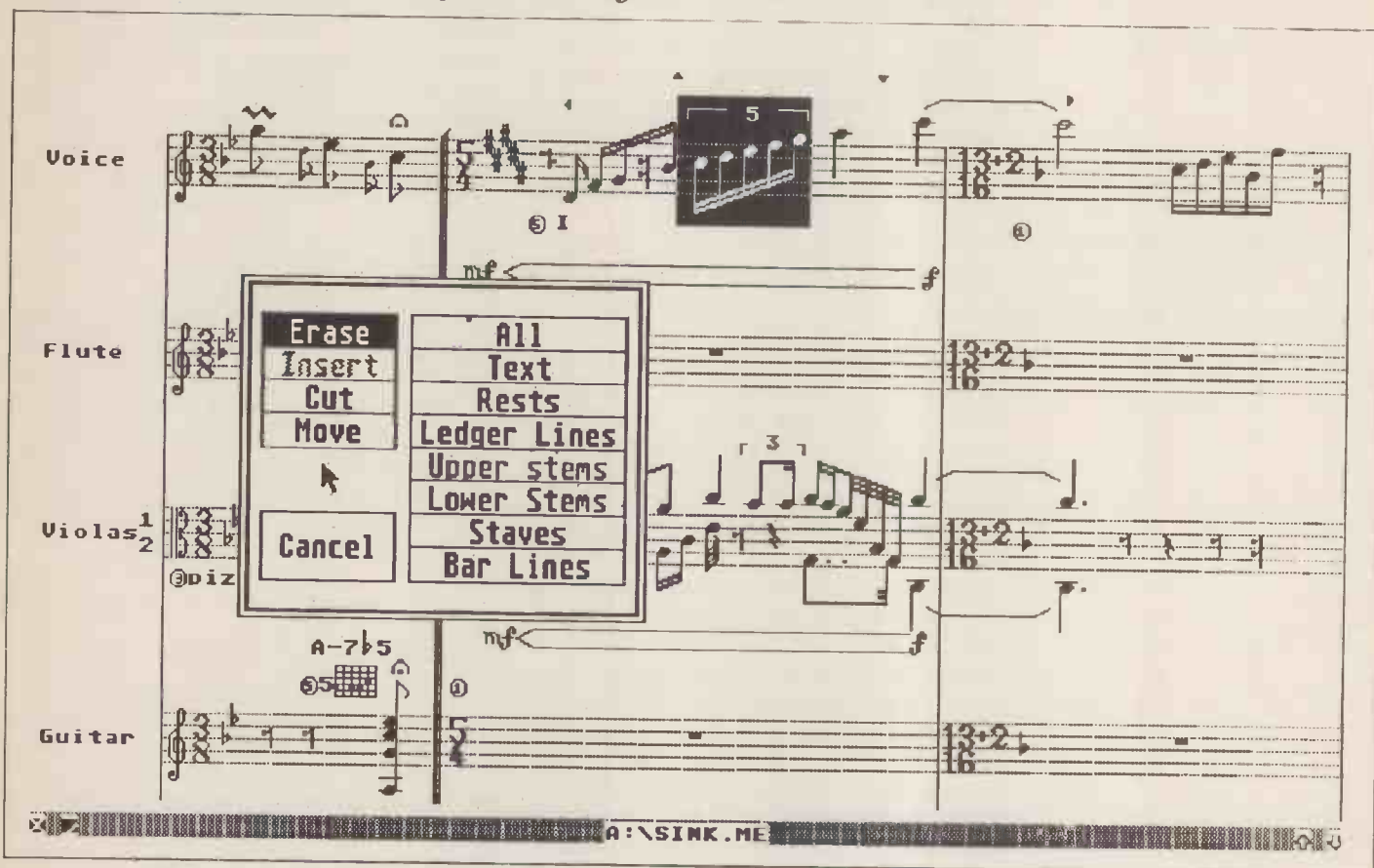
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Review by Lorenz Rychner.

IN THE BEGINNING, Dr T's released KCS (Keyboard Controlled Sequencer) for the Commodore 64 and Apple II. It featured an Open Mode – which worked differently to anything that was available at the time. Now, a few years later, KCS works on several more computers as both a normal and unusual sequencer, and has grown several arms: MPE (Multi Program Environment), PVG (Programmable Variations Generator), and Copyist (a transcription program). Time to get the prescription renewed.

Overview of KCS

DR T'S KEYBOARD Controlled Sequencer has evolved somewhat over the years. It is currently up to version 1.6 and Level II, the latter of which has some new sections –

namely, the Master Editor and the Programmable Variations Generator, or PVG. There's room here for only an overview of KCS (see review, MT March '87), so I'll give you an idea of what Open and Track modes are all about before describing the Doctor's latest.

In Track mode you can record up to 48 tracks. The length of track 1 (set it, and change it later at will) limits the length of all other tracks. Each track has its own screen, and all the features that you'd expect from an advanced program are there, including Step-Time Entry. There's no looping of individual tracks in Track mode, however; they either all loop or they don't. Repetitive phrases have to be in the track as linear data. You play it in once, then append it to itself, which takes up memory.

If your composition calls for a structure other than a short segment played once straight through, you'd probably use Open mode. Here you can record into sequences that don't have to be confined to the length of any other sequence. Anything can be a sequence: a single note (a sample trigger? a crash cymbal?) or a collection of merged tracks, a control sequence listing all the other sequences, including transpositions of pitch and velocity, repeats – you name it.

Master Editor

THIS COLLECTION OF magic elixirs is only available from Level II. It brings up six screens, and only the ▶

- ▶ currently selected one will affect the data in the selected sequence.

The first screen is called Blend; it lets you make changes to a track or sequence while the computer reads the data of another sequence (the reference sequence) as the model. This can be done by aligning pitches to those in the reference sequence, or velocity values, durations, rhythms, channels, or you can autocorrect some events to match exactly the times of events in the reference sequence. Of course, the model doesn't have to be copied exactly for all these parameters, and the computer will approximate them if you wish. The manual suggests this as a way of producing swing feel, although many other uses come to mind.

Chords is the next screen. If you unintentionally arpeggiated some chords and want to tighten them up, then the DeFlam feature is the tonic for you. Arpeggiation works the other way: it spreads out a chord over time.

MPE: "By clicking on the Ext function within KCS you can simultaneously load up to four Dr T's Editor/Librarian programs without the need to shut down the sequencer."

Sort could be seen as a preparation for Arpeggiation - it rearranges the notes in a chord in the order of their pitches, either ascending or descending, and with a skip (skip every other note first and play the skipped ones later) if desired. Velocity and duration can also be changed in several ways, and the Orchestration feature makes it possible for the notes to be assigned to a number of MIDI channels.

Controllers is a screen where MIDI events other than notes can be treated. After you define the controller, select Split if you want that controller's data to be extracted and moved to the next available empty sequence; select Erase to simply delete it, Thin if you need to thin out the density of controller data. As an example of using Thin, say you've used more aftertouch than necessary, and the sequence is flooded with AT events. Experiment with different Fraction Kept values (2 strips half the events, 3 leaves only one third and so on), and set a Maximum Time to ensure that events close to note events will be left in (one of the most considerate Thinning functions available overall).

Track Utilities allows changes to be made to all tracks: Deleting a range (shortens all tracks), Erasing a range (leaves a blank, like rests), Insert adds a range of rests. Let's look at an example of the latter: you need to extend a verse by one bar where you'll later add a drum fill. Set a Range Start and an Insert Amount in clocks, and all tracks will play nothing for a measure at that point. Back in Track mode you record the fill, give its first note the time value of the downbeat of that measure (there's a calculator on KCS's Edit screen); and you're done.

Pitch Map is the next screen. If your sampler had a crocodile bark assigned to the note D3 when you recorded it, and you want to change it to the snake hiss assigned to B5, maybe with a change in velocity, you're in business. You can even strip an individual note out of the whole sequence by giving it the command "Channel / Delete 0". A pitch mapping screen lets you reassign pitches over the range of seven octaves and three semitones. Be sure to realise that the good Doctor chose to flout the MIDI standard with MIDI note numbers - in all his programs, MIDI note number 60 is C4 as opposed to C3 (he's in powerful company, since Korg, Roland, Kawai, Digidesign and others do the same).

Finally, tempo commands can be erased or changed up and down in percentages, and accelerando/decelerando values can be converted into absolute tempo values.

The Environment

"MPE" STANDS FOR Multi Program Environment. On the track and sequence Edit screens it shows as Ext (for - you guessed it - external). Click on Ext - without the need to shut down the sequencer program - and you can load up to four Dr T's Editor/Librarian programs. The scoring/notation program Copyist is about to be updated for MPE. While in the editors, you have access to SysEx and to the disk drive of your choice (as defined on the System screen). When you select To KCS, you return to the last KCS Edit.

Of course, nothing's free - loading these programs into memory results in a reduction of available free events. Copyist, in particular, will take up a lot of space. In fact, unless you have a Mega ST (either 2 or 4), the Doctor points out that you won't have very much room for files if you load The Copyist and editor programs simultaneously.

The great thing about this integration is that you can listen to the current sequence play the patch you're working on in the editor program. Also, the time and aggro saved are well worth the trouble of getting the editor programs in the new MPE versions.

It's not readily apparent from inside KCS 1.6 that you can also unload the programs - there's no message to this effect, but there is one in KCS Level II: shift-click on the last program loaded to remove from memory. This restores all the memory, and worked flawlessly for me once I'd sussed it. It didn't work quite as smoothly with the KCS Level II and Copyist, because the latter was a pre-release version that hadn't been cleaned up.

Sequences to Notation

AS WITH ALL notation/conversion programs I've seen, you soon learn how to edit any rhythmically interesting sequences with Copyist so that the computer can display the music in a readable manner (there seems to be a rule that if it looks right then it'll sound dumb, and if it sounds right then it'll look dumb). There's a playback mode from the notation screen, which is nice, but compromised by the aforementioned rhythmic side effect.

If your music is destined to be read and played live and you have your copying skills together, you'll probably win over the computer hands down. If it's for hawking your songs around, go for it - the result can look very professional, and the link with the sequencer works like a charm.

The Fine Print

THE NEW PROGRAMS come with owner's manuals that are a far cry from the tiny books with miniature print that Dr T's distributed before. They are readable, ringbound in sturdy plastic, with indices and tables of contents. The Copyist's manual left me stranded a lot of the time, but the others made learning a breeze. The disks are copy-protected, by the way. Hard disk installation is possible, but the original disk must be in drive A during booting up to serve as a key disk.

The PVG

THIS ESCHER-LIKE space is also only available from within KCS Level II. The basic idea behind PVG is to take some of your existing sequencer material and create variations on it which you control by setting values for a ▶

For once it is nice to see other retailers copying our ideas (as well as our ads!). Free courses with packages, faulty goods replaced and money refunded are all part of a service to which a customer is entitled, and we are glad that other dealers are at last realising this.

Of course, most of them still don't realise that this service should extend to evenings, Sundays and bank holidays as well, but then you can't have everything - except at Thatched Cottage!

NEW STOCK

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

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- YAMAHA SPX50D MULTI PROCESSOR

Due to overwhelming demand we have finally produced a Thatched Cottage Newsletter. As well as giving details of some VERY special offers, it contains a complete secondhand and demonstration list (the list we advertise represents only a fraction of actual stock). There are also details of courses and classes and we briefly introduce ourselves!

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

IF YOU'RE INTERESTED IN BUYING A PORTASTUDIO SEND FOR A FREE FAX PACK

Atari - Cheap Computers

As many of you have no doubt discovered, Atari of late have developed an interesting method of quality control - it's called the end user! Because we have to replace duffo units (to ensure the minimum disruption to the customer), we have large stocks of nearly new Atari 1040 computers + monitors. Until the mountain has subsided we are offering these (with full guarantee) for only £450 + VAT if purchased with software!



When it comes to new equipment you may have noticed that we don't say 'phone for best deal, POA, or ring for lowest price ever'. Our bulk buying policy can usually guarantee that a telephone call to us will not be wasted and in any case we can throw in those "hidden" extras - cables with multitracks, patchbays with desks.

To be honest though, if you spend all afternoon on the telephone the chances are you might find someone somewhere who will

undercut us by a pound or two. The difference at THATCHED COTTAGE is if your E16 breaks down on a Sunday morning or your drum machine blows up on a Bank Holiday Monday you CAN ring us, we'll be here and we WILL do something about it - 365 days a year. Have you ever needed help and advice outside shop hours? if you are serious about your music you will know that it is quality of service that makes the difference and at THATCHED COTTAGE it's only a phone call away!



PRODUCERS' MASTER CLASS

From March we have been holding a series of one-day Master Classes featuring some of the world's leading producers. Each seminar will consist of a comprehensive question and answer session and a practical demonstration of production techniques in our own 24-track studio. In order to allow maximum flexibility

classes will take place at weekends and will be limited to the first 15 applicants. Those taking part include: Hugh Padgham, Rupert Hine, Stephan Hague... For anyone interested in producing, these classes will present a unique opportunity. Tickets are £50 + VAT each and are available from Thatched Cottage. For further details of dates and timetables phone Paul Tingen on 01-249 1876 or contact Thatched Cottage. Book early to avoid disappointment.

THATCHED COTTAGE RECORDING SCHOOL

In response to popular demand we now run a one week recording courses, designed specifically for those of you who feel they can make a go of running a professional 8, 16 or 24 track studio. The emphasis will be largely on the practical side and topics covered are finance, premises, running a recording session and hints and tips on every aspect of recording. Class sizes are limited to 8 at a time and guest speakers will cover relevant areas. The price is just £200 for the week, including accommodation.

Interested? Telephone or write and we'll tell you more.



Recently a few dealers have complained about our secondhand and ex-demo list - it seems they are losing too many customers! Being the largest supplier of 8 + 16 track equipment in Britain, we've decided we can afford to give away a few secrets! We simply tell customers that if any new equipment they purchase breaks down in the first two months we won't fix it, we will REPLACE it! Result? Yet another customer who KNOWS they can rely on Thatched Cottage, and a secondhand list full of the latest gear, factory repaired, in mint condition with a full guarantee! Simple? We didn't become the biggest without being the best!

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Fostex 350 8 track mixer+A8 8 track	£1199
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Tannoy Crossover	£250
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Alesis HR16	£340
Alesis MMT8	£225
Seck 12-8-2 Mixer	£775
Seck 18:8:2	£899
Scintillator (New)	£125
Ram 10-4-8 Mixing Desk	£599
Boom Stands, New	£18
Drawmer DS201/Dual Gates	£255
Yamaha RX5	£599
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Yamaha SPX90 II	£450
RSD Series II 16-16-2	£2,750
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Casio FZ1, silly price	£899
Casio CZ1	£499
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YAMAHA DEQ7	£605
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Yamaha MJC8	£169
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Fostex E8 NEW (8 track version of E16 (large reel)	£1499
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Akai X700 Sampling Keyboard	£599
Yamaha QX3 - super sequencer	£599
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Lexicon PCM70	£1250

(All prices exclude VAT)

For those of you who are seriously considering starting a commercial studio I've come up with three packages, each containing everything you will need for your first paying session, from the multitrack machine right through to DI boxes and cables. The price of the 8 track system is £4,300 + VAT, the 16 track is £7,800 + VAT and the 24 track is £15,500 + VAT. At Thatched Cottage I proved it *could* be done, and I have helped many new studios to open and start making money - my experience could help you. Give me a ring and have a chat - what have you got to lose? Plus: FREE Thatched Cottage Recording School Course to package buyers!!

FANTASTIC OFFER

To coincide with the launch of the amazing new Tascam 8 track cassette we have made a bulk purchase of Ram 10:8 desk to make an entire 8 track system (including plugs and cables) for the previously unheard of price of £1499 + VAT! Interested? Call in or ring for details!

SUMMER SPECIAL OFFERS!

Fostex E16 + 4050 autolocate/remote/SMPTE-MIDI converter. For a limited period we are not only offering E16's at a silly price, but we are including the 4050 (retail £899) in with the price £3500 + VAT! Tannoy Little Gold monitors - we have five sets of mint condition demonstration speakers (absolutely mint) £825

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Bel. We have just purchase several BDE2400 99 window delay samplers for extremely silly prices. These machines allow you to take 24 seconds of sound (at full 18kHz bandwidth, split into 99 different segments, edit & pitch shift any one (or all) piece them back together and play the whole thing via midi! Impressed? for just £799 you should be! (Retail £3000)

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► variety of parameters. Looking at it from a broader point of view, it's the most powerful editor you're ever likely to see. Downright intimidating, actually – particularly when you come up against screens that look like they're exam papers in maths, with terms like Set Values, Rotate Values, Gaussian, Macros, Consecutive Mults and In-betweens. And the manual waxes on about "Chaos making a new Science" and Mandelbrot diagrams – far out (as my dad used to say). And that's just where this program will take your music if you let it. But you're in control at all times, although it'll take you a long time to get a sense of how much control. Give it a little or a lot of music to work on, define the direction in which to take that music, set up restrictions, and see what results.

What you're building is a set of definitions called a Preset. The program can store up to 80 Presets. For more complex procedures, you combine up to 16 Presets into one of 20 Macros, so that the computer can combine the commands of the Presets in one operation.

The first screen in PVG is called Changes. A number of data fields are ready for entering parameter values that will randomly change pitch, velocity, duration, time, shift, and interval, based on the data on the Edit screen when you clicked on PVG. If you had a range (block) defined at that time, then that's the material the PVG will work on. It could be as little as a single event, or a whole song. You must further tell the program how many variations it should perform, and what the likelihood of varying one parameter over another should be. How do you know? Well, take a shot in the dark. Fill in some numbers under AMT (amount) and WGT (weight), set a number for Changes per Vary, and see what happens.

For an experiment I used the default C scale from sequence 1 in the Open mode, which moves by quarter notes from C4 up to C5. In the field Change by Constant, I entered Pitch Amt 2, Wgt 1, with Changes per Vary at 1, asking for 10 variations with evolving Mults, not overwriting the Original. Under Restrictions, where you delimit things that the program should not create, I entered the pitches of A, A#, C#, D#, E, F#, G#, with pitch limits of C4 and C5 for upper and lower limit (in other words, keep to the range of the original). Result: the program wrote 10 new tracks, each with eight notes picked from the C scale, at quarter note intervals (since I didn't ask for a time change), all between C4 and C5. They read like this: CCEFGABC, CCEFGGBC, CCDFGGBC, CCDFFGBC, CCDGFGB, CCEGFGB, CCDGFGB, CC CGFGBC, CDCFGBC and CDCFFGBC. The manual states that "the WGT value determines the likelihood that a change will be made by that particular amount". Read: low weighting, small changes.

Instead of Change by Constant, I could have chosen Gaussian, where the Amt column is replaced with SD

PVG: "The basic idea behind PVG is to take some of your existing sequencer material and create variations on it which you control by setting values for a variety of parameters."

(standard deviation, which the manual defines as "a statistical measure of the likelihood that a given change will be of some specified size"). It seems to mean that whatever you enter there won't always come up, but more often than not it will. And, I could have entered some numbers under Time and Shift which would have affected the rhythm and length of the scale. Selecting Staccato or Legato would have altered duration of the notes that would have been changed rhythmically. Signed Values is the third option, giving you more control than the others, since the changes seem to happen more gradually, and in the positive or negative direction that you can input.

Another screen lets you assign Swap/Copy functions,

where the source material isn't altered, just rearranged. Again you enter numbers, and you set up a protection scheme. Set Values will set a randomly chosen event to the set value irrespective of its starting value. Interval, Delete, and Erase work here, too.

Global Changes allows you to make changes to the unprotected notes of a sequence, not necessarily at random. This is a screen where you can make Edits in a predetermined way, by giving only the global change any weight (meaning no other parameters, even on other screens), and by setting the Changes per Vary to zero. This works for transpositions or inversions of pitch, velocity, duration, time reversal, delete, or erase options. Split/Pattern looks for patterns that you input (a certain interval or other relationship) and splits it off into a new track. By careful setting of the parameters and of the protection options, you can split off almost anything you want as opposed to random values.

In-Betweens looks at two existing sequences and creates new material according to some mathematical formula, while taking into account any Autocorrect values (for similarity in rhythm) and Scale Positions Restrictions that you have set. Another screen produces Ornaments (embellishment figures), including notes that weren't part of the source sequence. You can set the timing of the Ornament with Offset and Delay values. Other parameters contribute to the amount of time the Ornament gets played, or split the Ornament off onto another track.

Add Controllers is a way of introducing random controller data, not unlike the Ornaments (which are random note data). You choose from Delay, Type, and Value; consider Looping the result, or mixing the effect of several controllers at once. A fixed Program change can be added, and the introduction of new controllers can be stopped with Next Note Lim, Extend, & Duration. Controller events can be further modulated according to parameters like the pitch or velocity of notes. If you want to feel that you at least started the process, Vary Controllers needs some controller data to be present in the original in order to do its job. You specify which controller data should be varied, with restriction and protection parameters. These screens are interactive, and care must be taken to clear data before setting up another effect.

Verdict

I HAVE BY no means touched on every parameter: there are just too many. And given the interaction between screens, with the variety of effects that can come from them, you'll come up on Littlewoods before you exhaust the possibilities that PVG offers. With every change in the source sequence the outcome can change, even if you have kept the input values to a minimum and if you use just one Preset. Imagine what could happen if you wrote a Macro with 16 Presets, and lots of Changes per Vary in each.

How far you'd want to take KCS is largely a matter of taste. I doubt that musicians who are plugged into the realities of the commercial music scene will take the PVG portion of the program very far, while the excellent sequencer lends itself very well to real-life projects. But for you explorers out there, this is going to be paradise. The ability to jump to other programs with MPE just adds to the versatility. Cancel your summer holiday. ■

Prices KCS 1.6. £199; KCS Level II. £275; Copyist. £199. Upgrades should cost £10-15. All prices include VAT

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- MOOG OPUS III**, exc cond, £175. Darren, Tel: 01-648 8713.
- BERHEIM MATRIX 12**, massive sounds, £2950; EV S1503 PA cabs, pair £950, Tel: Oxford (08675) 71909.
- BERHEIM MATRIX 12**, ultra fat sounds, £2950; EV 200w PA cabs, £950 pair, Tel: (08675) 71909.
- ROLAND ALPHA JUNO 1**, as new, easy programming, MIDI, boxed, leads, manual, £350. Dave, Tel: Woodford 01-530 2974.
- ROLAND ALPHA JUNO 2**, boxed, home use only, perfect cond, £550, Tel: Rotherham (0709) 522714.
- ROLAND ALPHA JUNO 2**, immac, pro f/case + RAMS, £535 ono. Chris, Tel: 01-241 0458, eves.
- ROLAND ALPHA JUNO 2**, perfect cond with case, home use only, £550. Sean, Tel: 01-602 5934, eves.
- ROLAND ALPHA JUNO 2**, RAMS, pro f/case, exc cond, £535 ono. Chris, Tel: 01-241 0458, eves.
- ROLAND ALPHA JUNO 2** synth, touch-sens, 5-octave, stand, pedal, £450. Tel: Harwood 885758.
- ROLAND D50**, pedal, ROM card, £850; MT32 £250, both boxed, as new, Tel: (0468) 41505.
- ROLAND D110** sound module, brand new, £450 ono, Tel: 061-429 9323.
- ROLAND JUNO 6** polyphonic synth, 5 octave, chorus, £160, Tel: Harlow, (0279) 28218.
- ROLAND JUNO 6**, vgc, £175 ono. Trevor, Tel: 01-670 9707.
- ROLAND JUNO 60**, £250; Tascam 244 4-track portastudio, £350. Both unbeatable bargains, Tel: (0745) 30341/38402.
- ROLAND JUNO 60**, boxed, vgc, £310 ono. Or p/x for JX3P, or similar, Tel: Bexhill (0424) 210988.
- ROLAND JUNO 106**, exc cond, MIDI, selling to upgrade, £400 ono, Tel: Exmouth (0395) 263574, after 5pm.
- ROLAND JUNO 106**, f/case, stand etc, immac, £380; Yamaha FB01, £150; Roland Cube 40, and there's more! Tel: 01-399 7826, eves.
- ROLAND JUNO 106**, immac, £350; Roland TR808, classics, £180. Swap for good expander, Tel: (0342) 23094.
- ROLAND JUPITER 6**, £600; Kawai R100 + cartridge, £500; Brand new Alesis MMT8, £270. Rob, Tel: (0329) 46389.
- ROLAND JUPITER 6**, quick sale, £480; Korg MonoPoly, £150; DDM 220, £95; Korg vocoder + 5M10, £150. Sean, Tel: 01-366 1480, eves.
- ROLAND JUPITER 6**, MIDI update, f/case, perfect cond, £540 ono, Tel: (09592) 3548, eves and w/e.
- ROLAND JUPITER 8** with MIDI, f/case, £950 ono; Kawai KS, 2 weeks old, £999, Tel: 091-477 4419.
- ROLAND JX3P**, f/case, manual, good cond, £410. Tim, Tel: Marlborough (0672) 55150.
- ROLAND JX3P** plus PG200, home use only, exc cond, boxed, £400 ono, Tel: Hull (0482) 867132.
- ROLAND JX3P** with PG200 programmer, £450, mint cond, home use only, Tel: Beckenham 01-658 6991.
- ROLAND JX8P**, PG800, mint, boxed, manuals, £650, no offers! Tel: (0462) 480474.
- ROLAND JX8P**, super rich synth, immac cond, £590, Tel: Worthing (0903) 504930.
- ROLAND MKS70**, rack version of JX10 keyboard, virtually unused, immac, boxed, £585, Tel: (0442) 217715.
- ROLAND MT32**, 4 months old, perfect, £360, Tel: Shropshire (07462) 2971, after 7pm and w/e.
- ROLAND MT32**, as new, £390 ono; Korg Poly 800, £250. Both boxed, manuals, psu's. Darren, Tel: 01-595 3552.
- ROLAND MT32**, boxed, as new, £325; Roland TR727, boxed, as new, £175, Tel: Southend (0702) 232448.
- ROLAND MT32**, as new, guaranteed, £380; Casio CZ3000 synth, £290; Casio 521; sequencer, £75, Tel: (0733) 321726.
- ROLAND MT32**, guaranteed, boxed, manuals, £350 ono, Tel: (0382) 24688, Thursdays before 4pm.
- ROLAND MT32**, immac, manuals etc, £395 ono. (Swap DEP 5 or p/x Midiverb II), Tel: (020) 488 6744.
- ROLAND MT32** multitimbral expander, boxed, plus MT32 editor for Atari ST, £390, Tel: (0244) 48810.
- ROLAND MT32** multitimbral expander, mint cond, incl 5T editing software, genuine bargain, £320. Dan, Tel: 051-733 2858.
- ROLAND MT32** plus editing software, 3

months old, home use only, £380 ono. Will, Tel: 01-274 6022.

ROLAND SH101, Moog Rogue, Casio SK200, Roland TB303, Digisound modules, offers, swaps? Grant, Tel: (0597) 2138.

SCI SIXTRAK MIDI mono-mode, mint

Sequencers

ALESIS MMT8 seq, £180; Kawai R50 drum machine, £180; Yamaha DX100 synth, £140, Tel: (04862) 61297.

CASIO SZ1, manual, boxed, good cond, £90 ono. Tim, Tel: (0734) 700121.

KORG SQD1, £180; Fostex 4-track 250, £200, Tel: 01-249 3727.

KORG SQD1 plus disks, good cond, offers, Tel: (0602) 393413.

KORG SQ8, ten months old, £175; Accessit reverb, psu, £60, Tel: Brighton (0273) 473764.

ROLAND MC202, boxed, manuals, hardly used, built in mono synth, mint cond, £80. Anita, Tel: 051-644 9201.

ROLAND MSQ700, £200, or swap decent mixer, analogue MIDI synth, or Microverb plus lolly, Tel: (0772) 315638.

ROLAND MSQ700, classic MIDI seq, a snip at £150. Paul, Tel: (0772) 315638.

YAMAHA QX1, perfect cond, home use only, £495, or make an offer. Can deliver, Tel: (04427) 2373.

YAMAHA QX7, £550 ono. Andy, Tel: (0702) 460301, after 6.30pm.

YAMAHA QX21, mint, boxed, £175; RX15, professional quality, £180; reverb, £20, Tel: (09592) 3548, nr Sevenoaks.

Drums

AND THE LORD SAID unto Roland, "Those TR707 drums brother! Only £199!". Douglas, Tel: 01-989 3766.

BOSS DR220 2 months old, £80; Also Yamaha VSS30 portable sampling keyboard, £30. Steve, Tel: St Albans 32228.

CASIO RZ1, £250; Weston Thunder la bass, £100. Both ono. John, Tel: (0737) 552456, eves.

CASIO RZ1, Roland TR909, Casio SZ1 seq. Any reasonable offer accepted. Patrick, Tel: Birmingham 458 5134.

CASIO RZ1 sampling drum machine, boxed, £150. Steve, Tel: 01-231 1230.

KORG DDM100 digital drum machine, immaculate, home use only, boxed, leads etc. Bargain, £80 ono, Tel: 051-486 0354.

KORG KPR77, psu, soft case, manuals, on-board mixer, triggers etc, mint, £75. Anita, Tel: 051-644 9201.

OBERHEIM DX drums, and Prommer (sampler/expander), exchangeable sounds, classic machine, £400. Andrew, Tel: 01-743 0368, from 7pm.

ROLAND TR505, as new; Boss, psu, manuals, etc, £130. Richard, Tel: 01-856 7917.

ROLAND TR505, boxed, manuals, vgc, home use only, £160. Tim, Tel: Marlborough (0672) 55150.

ROLAND TR505, home use only, boxed, manual, adapter. Paul, Tel: (0759) 72094.

ROLAND TR505, immaculate, home use only, boxed, leads, manuals, £170 ono. Mike, Tel: 01-948 5763.

ROLAND TR606, £85, with manuals and batteries, Tel: (0732) 451909.

ROLAND TR707, psu, manual, boxed, immac cond, £300; with Roland MC202, £325, Tel: 091-549 5215.

SEQUENTIAL TOM, as new, unused, £145; Magnum 12:2 stereo mixing desk, bargain, £90, Tel: (0977) 557560.

YAMAHA RX5, separate outputs, programmable tuning + EQ etc, home use only, £595, Tel: 021-643 7497.

YAMAHA RX15, mint, boxed, as new, £160, Tel: Shropshire (07462) 2971, after 7pm.

YAMAHA RX17 drum machine, boxed, with manuals, mint cond, £175 ono. Paul, Tel: (0275) 426925.

YAMAHA RX17, mint, £200; Yamaha RX21 seq, 3 months old, £125. Both £300. Rick, Tel: (0532) 505359.

YAMAHA RX21 drum machine, perfect cond, boxed with manuals, £95. Jules, Tel: (04514) 523.

Computing

48K SPECTRUM, Spectrum printer, software books worth, £400, now, £100. Ben, Tel: (0702) 715870, after 4.30pm.

AKAI S900 editor by Steinberg, uneeded latest version, £180. Tinley, Tel: 01-539 4888.

ATARI 520 STFM, MIDI software, seqs, games etc, £250; Colour monitor available, cond, fat sounds, with box, £320. Heinz, Tel: 01-981 3737.

SEQUENTIAL PRO I with case, £120; Boss RCL 10 compressor, £80; Crumar Multiman-s, £50. Andrew, Tel: (0302) 530605.

TECHNICS PX7 PIANO, 5 piano sounds, weighted keyboard, full MIDI, exc cond. John, Tel: 01-260 9216, days, or 01-671 4215, eves.

TECHNICS SX-K700, £740; Alesis MMT-8, £275; Elka X30, £2250, Tel: 01-572 3800.

YAMAHA CLAVINOVA CVP-5, piano feel MIDI keyboard, built in seq, rhythm. Richard, Tel: (037) 881 2079, eves.

YAMAHA DSR 2000, mint, 100 voices, drums, seq, MIDI, + adapter, £650, Tel: Brighton (0273) 509506.

YAMAHA DX7, absolutely perfect, 4 cartridges, pedals etc, £750 ono; Miniimoog, £350, Tel: (0452) 26010.

YAMAHA DX7, RAMS(3); Korg DDDS, RAMS(2); Roland MT32. All immac, £675, £400, £300 respectively, Tel: 01-581 0257.

YAMAHA DX7 with ROMS and free hard case, £695. Dave, Tel: (0920) 4985.

YAMAHA DX21, as new, with case, stand, sustain pedal, manuals, £425 ono, Tel: (0934) 21964.

YAMAHA DX21, stand, case, books, tapes, vgc, £300, Tel: (0544) 7500.

YAMAHA DX100, £200; CheetaH MK5, £60; 50w amp, £40, Write: Arron, 10 Sycamore Avn, Boythorpe, Chesterfield.

YAMAHA DX100, £200; RX21, £100. Both immac, home use only. Andrew, Tel: 061-969 8714.

YAMAHA DX100, £200; RX21, £100; MR30 4-track, £140, as new, adapters, boxed, will post! J.Oldrieve, Tel: (0405) 861169.

YAMAHA DX100, FB01, and QX7 seq, boxed, as new, £525 ono, will split, Tel: Plymouth 708018.

YAMAHA DX100 synth, £200; RX21 drum machine, £100; MCS2 MIDI control station, offers. Andrew, Tel: 061-969 8714.

YAMAHA PSR 6300 keyboard, top of the range, as new, £850, Tel: (0325) 286618.

YAMAHA TX81Z, £295; CheetaH MK5 keyboard, £50. Both as new, Tel: 021-357 2487.

YAMAHA TX81Z, boxed, as new, incl 400 extra voices, £295, Tel: Kingsbridge (0548) 561304, S.Devon.

Sampling

AKAI S900 + library, hardly used, boxed, £1450. Ayo, Tel: 01-253 5657, eves.

AKAI X7000, ASK70, memory expansion board, disks, £800. Steve, Tel: Stevenage (0438) 814433.

AKAI X7000 (expanded), soundfiler editor, 100 samples, £750; Casio CZ5000, £450. Tony, Tel: (04427) 75284.

AKAI X7000 latest software update, crossfade looping, separate outputs, many disks, £700, Tel: 01-898 1276.

AKAI X7000, separate outputs cable, 20 disks, f/case, exc cond, £825 ono, Tel: Dundee 24688, Thursdays.

CASIO FZ10 sampler, new, £1000; 66 disks, studio quality samples, £200, Tel: 061-429 9323.

CASIO SK2100, new cond, psu, sample sound, tape, £175, Tel: Portsmouth (0705) 596087.

EMAX SE and 60 voice disks, £1390, Tel: (0843) 69890, days.

ROLAND S50 V.20, full library, immac, £1500. Andy, Tel: Brighton (0273) 203438.

YAMAHA VS100 sampler/keyboard, useful for newcomer to sampling, £95 ono. Kev, Tel: (0494) 465566, after 6pm. £150, Tel: 01-291 7244.

ATARI 520 STFM, 1 year old, immac, £200, Tel: Shropshire (07462) 2971, after 7pm.

ATARI 1040 STFM high resolution monitor, some software, £530, still boxed, Tel: Sheffield 757264/701170.

BBC B, D/Drive, EMR MIDI interface + seq, Music 500, First word, books etc, £250, Tel: 01-289 2187.

BBC B MUSIC 500, books, software, immac, give away, £125, with RGB/TV, £325. Liam, Tel: Buxton (0298) 871670.

COMMODORE 64 and Pro16 V2.4, complete system incl DX7 editor, £250, Tel: Southend (0702) 367163, days.

COMMODORE 64, Steinberg Pro16, DX, Mirage editors, d/drive, £250 ono, Tel: 01-289 2187.

COMMODORE A500, TV modulator accessories, 6 months old, cost £800, £500 ono, Tel: (0703) 431356.

COMMODORE C128/64, MIDI interface and software, £35; Roland TR606, £85, Tel: (0732) 451909.

MIDI SETUP, BBC B colour monitor, DD UMI 501, Korg Poly 800 synth, Tel: (0702) 618391.

MIRAGE EDITOR for Atari ST, Hybrid Arts Oasis, as new, a bargain, £145! David, Tel: (0353) 666449.

PRISM 2000 MODEM, new in box, 1200/75 1200/1200 baud (with BBC/MNET ROM incl), £80, Tel: (0670) 854680.

MUSIC 500, add-on for BBC B micro, must sell, any offer considered. James, Tel: 061-231 2418 or (0742) 745709.

SONY DISKS, 3½" HD, and Sony 3½" D/D disks boxed in 10's; Phillips colour monitor, offers, Tel: (0926) 35535.

SPECTRUM + 3 kits, £25 ono; Datal sound sampler, £25 ono; Tandy Realistic Reverb, £25. Steve, Tel: (0642) 552179, eves.

SPECTRUM + 4 kits, £25; RAM music machine, £35. Garry, Tel: (0695) 624668, after 7pm.

SPECTRUM 48K + AI sampler, sequence from MC202 etc, £80 ono, swap? Paul, Tel: (0742) 313829.

SPECTRUM music fanzine for owners of RAM CheetaH XRI interfaces. Musonic, 34 Kingston Road, Romford, Essex.

SPECTRUM XRI MICON MIDI interface, 8TK seq + MIDI database, £45 ono; CX5M FB01 editor, new, £25 ono. Steve, Tel: (0642) 552179, eves.

SUPER CONDUCTOR SOFTWARE, £30. Wanted, FB01 editor, Tel: (0558) 822134.

UMI 2B SERIES 5, professional sequencing software, interface, £200; BBCB, d/drive, ROM board available separately, Tel: 01-586 7307.

UMI SEQUENCER, £175; BBCB 40/80, drive, data cassette recorder and software, £275, Tel: 01-769 0430.

XRI MICON, MIDI interface, step realtime seqs, CZ editor, 100 sounds, £70 ono. Paul, Tel: (04577) 3158.

XRI SOFTWARE CZ editor, step seq, also Spectrum. All £10 each, Tel: (05242) 62258, after 6pm.

YAMAHA CX5M, large kbd, monitor, seq, software etc, £230; Vestafire MR30, £120, Tel: (0353) 740690.

YAMAHA CX5M, large kbd, various cassettes, £160, or swap QX21 or QX5, Tel: (0622) 670212, Kent.

YAMAHA CX5M, small keyboard, Composer, 2 voicing cartridges, good cond, boxed, £210. Steve, Tel: (0642) 552179, eves.

YAMAHA CX5M YK01 keyboard, music composer, voicing software, seq, data recorder, boxed, £200 ono. Ian, Tel: (02357) 65881.

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YAMAHA CX5M YK01 keyboard, music composer, voicing software, seq, data recorder, boxed, £200 ono. Ian, Tel: (02357) 65881.

YAMAHA CX5M YK01 keyboard, music composer, voicing software, seq, data recorder, boxed, £200 ono. Ian, Tel: (02357) 65881.

ALESIS MIDIFEX, digital delay and reverb, MIDI, boxed, as new + psu. Mark, Tel: 01-698 5662.

ALESIS MIDIVERB I, £180; Ibanez DM1000 delay, £155; Boss micro/rack flanger, £65. All perfect. Paul, Tel: (0532) 865197.

BARCUS BERRY sonic maximizer 402, £185; Harrison DSA800 digital amp, £550; Roland MC202, £85, Tel: (0702) 521570.

B&O 3-SPEED stereo reel-to-reel; Echo/Reverb SOS/2-track, £90, Tel: St Austell (0726) 66715.

BOSS BX600, 6 channel mixer, effects send, very quiet; Roland TR505, sep outs, £175, £100, Tel: (0395) 263179.

BOSS DE200 digital delay, chorus, flange, ADT etc + hold trigger, £120 ono. Chris, Tel: Bristol 775747.

FOSTEX 250, limited home use since new, £345. Pete, Tel: (0324) 486165, Scotland, after 4pm.

FOSTEX 350 8:2 recording mixer with meter bridge, exc cond, £250, Tel: 061-431 5318.

FOSTEX XI5 and MN15 mixer, £160; MC202, £60. £200 for both, Tel: 01-421 1970.

FOSTEX XI5II, mint, £180; Casio CZ101, £150. Stephen, Tel: (0603) 56161, ext 2550, days.

MTR 16:2 plus DDL, £500; RXII + 2 cartridges, £350; KMS-30, £100. Sean, Tel: 01-366 1480, eves.

REALISTIC 6-CHANNEL mixer, 5 outputs, dual-band equalisation, VU meters, f/case, £100, Tel: Woking 67384.

SONY TC377, needs attention, ideal tape echo, £650 ono. Simon, Tel: Reigate (07372) 44126.

TANNOY 6:2 EQ pots, £70; Tannoy disco, 3 mics, pickups, £25. Tim, Tel: (0395) 264412.

TANTEK MODULAR FX. Sampler, gates, compressors, EQ, enhancer, modulation, oscillator, 19", £600, Tel: Darlington (0325) 466826.

TASCAM 32, ex-studio, perfect cond, 6 months guarantee. Ross, Tel: (0494) 443418, days.

TASCAM 34, immaculate, boxed, as new, £585 ono, Tel: (0634) 828089.

TASCAM 38 with Bel noise reduction, £1400; Yamaha RXII, £280. All exc cond, Tel: (0562) 515846.

TASCAM 58 1/2" 8-track, £2500; Tascam 32B 1/4", £450; Chesham 100w per channel stereo amp, £150, Tel: (0223) 316211.

TASCAM 80-8 8-track, worn heads, £500 ono; AHB MOD3 16:8:16, £400, Tel: Darlington (0325) 466826.

TASCAM 246, £725; SECK 6:2, £265. Both 1 year old, mint cond, 246 recently serviced. Tel: 051-356 0019.

TASCAM PORTA TWO, £450; Korg DRV 2000 (stereo multi effects unit), £350. Both exc cond and still under guarantee. Tony, Tel: (0274) 547813.

TEAC A-3340S 4-track with remote and original reels, recently cleaned and serviced, £375, Tel: (0272) 671076.

USED TAPE, erased 1/2" 456 & 406, £11 & £8; R/2120 for 3340, £20, Tel: (0533) 434338, am, and after 5.30pm.

VESTAFIRE 4-track recorder, boxed, psu, mint cond, home use only, £225 ono, Tel: (0705) 25881.

VESTAFIRE MR-10, 6 months old, home use only + psu, boxed, £250; Also CR1000, as new, £220. Chris, Tel: (0625) 524330.

YAMAHA MT2X, mint cond, professionally cleaned and serviced, £430. Dave, Tel: 01-904 3405, or 01-437 6731.

YAMAHA RM804 8:4:2 mixer, home use only, £450, Tel: 01-723 5842, eves.

YAMAHA SPX90, immaculate, manuals etc, £375 ono, (Midiverb II considered as p/x), Tel: (0204) 886744.

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YAMAHA SPX90, immaculate, manuals etc, £375 ono, (Midiverb II considered as p/x), Tel: (0204) 886744.

CARLSBRO KEYBOARD 90 combo, £185; Tascam 234, £450; Steinberg MT32 editor, £70; also SH101, Tel: (0256) 87294.
FENDER TWIN REVERB, mint, £350; Vox 200W. PA, never gigged, £450, Tel: (0625) 871062, Manchester area.
HARRISON DIGITAL 800W stereo amp, bargain, £500; MCAB + OP8 + DCB to MIDI interface, Tel: (0702) 621 570.
LESLIE 860 and 825 speaker cabs, exc cond, both incl pre-amp, offers, Tel: Paisley 041-884 4518.
MUSICMAN IIZRP 65W, £250; Roland space echo RE101, £175; Roland GE10 graphic, £40, Tel: 01-291 4163.
PEAVEY AMP TKO 80, good cond, £75; Antoria bass guitar, black, good cond, £75, Tel: 01-863 6230.
RSD STELLAR FET I studio 100W amp, immac cond, £170 + free HI-FI speakers, Tel: (066) 85360.
VOX VENUE 100W kbd combo, as new, home use only, £195 ono, Tel: Preston (0772) 792280.
YAMAHA 100W AMP, 2 2X10 cabs, £300; Hammond M100 organ, classic sound, £150, Tel: St Austell (0726) 72190.

Personnel

17 YEAR OLD seeking w/e or part-time studio work. Keen, well grounded, teaboy! Simon, Tel: 01-339 4307.

21 YEAR OLD keyboard/vocalist with home studio seeking creative guitarist in Swansea area, Tel: Neath 53585.

BASSIST AND SINGER need keyboardist, drummer and guitarist, commercial songs await. Glen, Tel: Birmingham 021-784 8321, after 6pm.

CADI 88, August 22-26, 5th meeting of MUSICA, CIBERNETICA and Natura. Josa de Cadi. Marti Brunet, Apdo. Correos 482. Manresa 08240, Spain, Tel: 8744041.

CHRISTIAN VOCALIST (guitarist?) wanted by North East band, (U2, Rush, Big FELLOW SYNTHESISTS required to create PSB type music within my studio in Stevenage. Brian, Tel: 723630.

LYRIC WRITER seeks composers for long term partnership. WDT S.Anderson HQ4 signals group, BFPO 140, W.Germany.

PRO SINGER/GUITARIST, 28, seeks same for working duo. Swedish resident, British family, steady work=move. Magnus Rubensson, Maratonvagen 30A S-30254, Halmstad, Sweden.

SINGER AND/OR DRUMMER (15-18) wanted to complete Romford based guitar-keyboard-bass line-up, Tel: (0708) 762103 between 4-9pm.

SYNTH DUO require professional sounding vocalist for chart and live work. Mike, Tel: 021-354 8377.

SYNTH PLAYER/PROGRAMMER wants to join group/vocalists for song writing. Pete, Tel: Lowestoft (0502) 740831.

TAPE-OP/ENGINEER seeks work at major studio, experience, hard working. Peter, Tel: 021-427 7854 after 6pm.

VOCALIST REQUIRED for taking band into gigging. Roger, Tel: Beaconsfield (04946)-6826, eves.

YOUNG BIRMINGHAM BAND (17-22) Is auditioning male singers and "human drum machines", interested? Andy, Tel: 021-422 9846.

WANTED, dedicated versatile keyboardist, early 20's, own gear, to join Portsmouth band. Rob, Tel: (0329) 46389.

Country). Duncan, Tel: (0207) 504023 or Dave, Tel: (0207) 590375.

CREATIVE MODERN instrumental composer/multi-instrumentalist seeks serious promotion, management and guidance. Richard, Tel: (0793) 512366.

DANCE LABEL wants new dance music, house, newbeat, electro, K7 Clip School St10, B-9300, Aalst, Belgium.

Misc

ALESIS MMT8 sequencer, £180; Kawai R50 drum machine, £180; Yamaha DX100 synth, £140; Korg DDM10 and MC202, £100, Tel: Woking (04862) 61297.

ARION PEDALS, overdrive, £25; Stereo chorus, £25; Stereo delay, £40; Tuner, £25. Steve, Tel: 01-444 8588, eves.

AUDIOLOGIC quad gate, ultra quiet, ultra fast, £239; Roland RPS10, digi-delay/harmoniser, 15kHz, £115, Tel: (02576) 2609.

BOSS BX600 mixer, effects send etc, £100; TR505, sep outs, £175, mint. Steve, Tel: (0395) 263179.

BOSS PEDALS: CE-3 chorus, £70; Graphics, £60; Frontline 8:2 rack mixer, £85; TR606, £60, Tel: 01-586 7307.

CASIO 1000P, £100; ROLAND 505, £185; TASCAM 244, £450; Premier vibraphone, £700. Simon, Tel: 01-737 2205.

Wanted

£100 CASH for Alesis microverb in good nick, Cleveland area, Tel: Middlesborough (0642) 817369.

ACCESSIT RACK, 1 unit wanted, swap or sell; Roland S50 disks. Marc, 61 Lyndhurst Rd, Luton.

ALESIS HR16 or DDD-1 or K100 drum machine, price negotiable or p/x TR505. Steve, Tel: (0395) 263179.

ATARI S20ST, £200; Master Tracks Junior, £50; HS-1/FZ1, £700; Porta-05, £200; TX8Z, £260. Barry, Tel: 091-570 8956.

CASIO CZ101 and Korg SQD1 in good cond, will pay £100 and £230 respectively. Simon, Tel: Cheshire (0625) 523845.

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INFORMATION on early Soft Cell equipment with perspective to purchase. Kriss, Tel: (0827) 57103.

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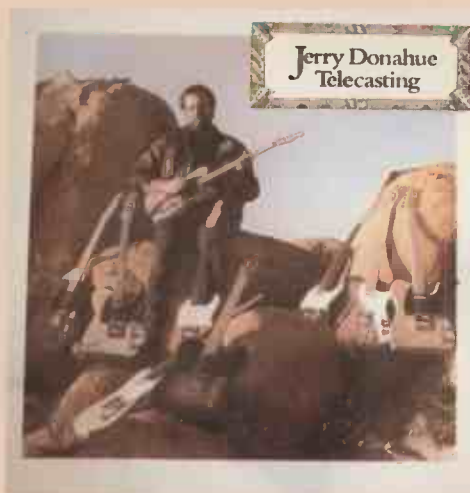
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