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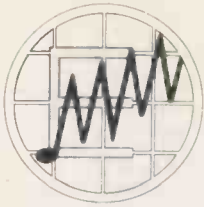
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Electronics & Music Maker

February 1984

Volume 3

Number 12

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Publishers Glidecastle Publishing Ltd
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Cambridge CB4 1UY
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Distributors Punch Distributors Services
23-27 Tudor Street,
London EC4 70HR

Printers Thomas Reed Printers Ltd
(Sunderland and London)

Typesetters Pearl Quest Ltd
Billericay 55755

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Pressing On

After what appeared to be something of a pre-Christmas lull, the major manufacturers of electronic musical instruments are about to unleash a rash of new products for the new year. Two of them, the Korg Poly 800 and the Boss DE-200 digital delay, are reviewed in this issue, while the next two or three editions of E&MM will see a large number of other new goodies coming under the microscope.

While there's no discernible trend common to all these pieces of equipment, what is fairly clear is that the cost of components incorporating new technology is still tumbling down at a fantastic rate. What this means – unfortunately – is that last year's innovation is often out-dated and superseded before the market has fully come to grips with what it can do. On the positive side, a lowering in cost can only benefit the consumer in the long run, and the more available new technology becomes, the greater the numbers of people who will start taking advantage of its presence and begin employing it to create their own music.

Yet once this first step has been taken, many up-and-coming musicians are at a loss as to what to do with the fruits of their endeavours. For while it's true to say that the E&MM offices have never been as inundated with readers' cassettes than they are now, it is also equally true that a great deal of electronic music never gets beyond the habitat of its creators.

And that, in our view, is a pity.

Agreed, major record companies are always difficult to approach, particularly by those unfamiliar with their workings, but there is an alternative in the form of the independent record label, a phenomenon that first appeared in the late seventies and has continued to grow in importance since then, despite some general disapproval on the part of the fashionable music papers.

Although making your own record is considerably more costly and time-consuming than simply duplicating a cassette, it has the advantage that it's far more likely to get noticed.

It could be argued that, of all the various types of music that exist in today's rather schizophrenic artistic world, electronic music has benefitted least from the appearance of the indie label; but that doesn't mean to say that our sort of music isn't worth putting onto vinyl as opposed to magnetic tape. With the enthusiasm and skill displayed by so many of our readers in recording and producing their own compositions, we tend to think that electronic musicians could show the rest of the world a thing or two when it comes to producing an independent disc.

So if you've put out an independent record of some kind at some time during the past year or so, or are contemplating doing so, we'd like to hear about it. We'll publish any article we feel might be of use to fellow-readers, and if there are sufficient correspondents, we might consider compiling a directory of independent electronic releases.

And heaven knows, making an indie record has proved to be the first step on the road to success for so many acts in recent years, it's very difficult to make a convincing excuse for not having a go yourself if you've sufficient capital.

After all, look at China Crisis now



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Message Of Support Dear E&MM,

Since you've been taking a bit of stick recently from some quarters, I thought I'd send a little message of support.

I've been buying E&MM every month (well, almost!) since issue one because it reflected my interests almost exactly. As times have changed the editorial policy has shifted to keep in with the times. I can never understand people who criticise this, since I for one would hate to read a magazine that remains stagnant, oblivious of all that's going on around it.

Of course, various unscrupulous people have realised that E&MM are on to a good thing and have come up with rival publications, but in my view most of these are very poor imitations. Here is my appraisal of your competitors.

International Musician - A joke magazine. Serious musicians steer well clear.

Music UK - As above only smaller and therefore not quite so dangerous. Caution should still be exercised in shops stocking it.

One Two Testing - Very pretty pictures and arty layouts: pity about the words. Does anybody actually read it?

Keyboard - Full of long-haired, potbellied Americans wasting vast sums of money on sexy-looking keyboards they never use. Plus articles on how to get your Fairlight to sound like a Minimoog. To be avoided at all costs.

Electronic Soundmaker - What a rip-off! A bit like E&MM for children ages twelve and under. Perhaps Mothercare should distribute it.

Mind you, even E&MM errs occasionally. I can't stand Saga and those photos in the January edition were awful. Otherwise, it's perfect. Just keep it coming.

Phillip Hoadley
London SE25



Interface Dear E&MM,

I thought I would write in reply to your Editorial 'Interface 84' in the January Issue. Yes, everyone would like there to be more communication between the various

sections of the music industry - and I certainly would agree that there is too little, but can't the problem lie in the actual users of the equipment?

For years, the players have been working on equipment that has been carefully put together by the makers, who have taken the time and trouble to write manuals to explain them to the user. Now, like Hawkwind, lots of people simply throw the manual away and try and learn the ways of the instruments in their own sweet way. Then, later, when they need the basic information to move on - they are at a dead loss.

Yes, the makers do try to communicate - and they usually have a sort of service where the muso can write back to them with any suggestions that they have. I have used this in the past (even writing to Japan) - and I've never had anything but the best of help from them.

Certainly campaign for a more local information service (thanks Roland for the 'Hotline'), and a standard series of terms would be an aid - but take a look through the manuals first!

George Gregory
Kensal Rise



Vigier Blues Dear E&MM,

I read with interest your review of the Vigier Bass Guitar, and a couple of thoughts occurred to me. First of all, having the display on the bass is a great idea (in fact the whole thing is) but I'm fond of my own bass, and as well as that I haven't got the pennies for the Nautilus! So, couldn't the same technology be applied to amps. Then we'd have a selection of sounds from the amp itself. Any chance of a project?

Adrian Tothill
Ipswich

Nice idea, Adrian, and one that certainly might work. We'll have a look at the theory side and see if we can't work something out.



P.C.B.'s Dear E&MM,

I am writing in agreement with Mr G.K. Prosser in Dec 83

concerning foil patterns for your project P.C.B.s. If you can't find the space, how about scaling up the overlays to full size so that those of us who enjoy making our own P.C.B. can make our own foils without all the fuss of scaling the overlays up to size ourselves (try it yourself someday - it's no fun!).

I would also like to agree with the reader who suggested that you do an interview with Mike Oldfield (possibly with a complete discography including singles). While I am on the theme of things I would like to see in your magazine, I suggest more of Jef Macaulay's Hi-Fi articles (they seem to be getting rather sparse) and fewer reviews of synthesisers.

I was very impressed by your history of electronic keyboard instruments and particularly by some of the odd tone generation circuits. How about some experimental projects using other things instead of VCOs to generate tones, or perhaps a Theramin project.

S.P. Ridley
Thanks for the suggestions, we're working on the PCB's now and hope to find an equitable solution soon. As far as the experimental projects go, we have to cater for the majority - but we will try for some 'alternative' ideas during 1984.



Sequencers Dear E&MM,

Just a quick note to say the new workshops 'Using Sequencers' and the Jan 84 'Modular Synthesis' are brilliant! Especially with the sequences given for us to load and play with.

I am sure there are many E&MM readers, who like me have a total mental block when it comes to music notation and actual keyboard playing ability (or inability!), and we need the keyboard playing done for us by sequencers, and the notes to load into the sequencers provided by someone who does have musical ability, then we can get on and use the sequencers to play the notes whilst we change sound parameters.

I have spent hours and hours using the sequences given in the last issue at different speeds with different sounds - and great fun I have had!

K. Comber
Huntingdon

Wires Crossed Dear E&MM,

Your Mr Lewis (Readers' Letters, January) has got his wires badly crossed. E&MM's strength has always lain in the fact that it manages to keep ahead of the rest of the field. It was the first magazine to realise the growing importance of electronics in music, and the first mag to link the two together in a sensible and constructive way. It took a long while for other publishers to get their act together and produce anything that could compete, and they still haven't really accomplished that now.

But one thing that has happened since E&MM first appeared on the bookshelves is that ready-built musical instruments using electronics have decreased dramatically in price, due mainly to advanced manufacturing techniques. This has meant that the price difference between a factory-constructed, professionally-finished unit and a kit is now a lot smaller than it used to be, which makes kit-building a much less attractive proposition, at least from my view.

The only area where the manufacturers are still lagging behind is that of computers, where the lack of sensible music programs and interfacing available commercially has led many people to build and/or design their own. E&MM's computer coverage is not excessive in this context, as sooner or later the vast hordes of home computer-owners are going to get fed up with playing childish games and begin to see the usefulness of their box of bytes in the context of making music.

If E&MM didn't produce computer-based projects, you can bet your bottom dollar nobody else will - not yet. So make sure you keep ahead of the field and don't slacken up. Carlsbro Christmas Club indeed!

A. Finestone
Cockfosters



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E&MM/1/84

MUSIC MAKER EQUIPMENT SCENE

This year's Frankfurt Music Messe – the premier exhibition of the year – takes place at the Frankfurt Expohalle at the beginning of this month. A special three-page survey of the new products from British manufacturers appears on page 20.

Among the many products at the show, will be a new keyboard combo from Custom Sound. Entitled the 727 Keyboard Combo, the unit has been specifically designed with stage keyboards in mind.

The amp has three channels, and each one features vol, bass, treble, and built-in reverb. There is a master vol, and master presence control.

The speaker used has been specifically designed for the 727 by Fane, and is rated at 100W, while a horn is added for extra high frequency response.

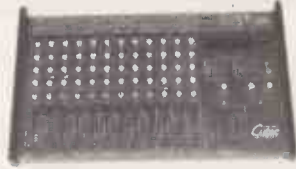
Details from, Custom Sound, 16, Landcroft Road, East Dulwich, London SE22. Also at Frankfurt will be the new Cutec MX1210 12:2 mixer, distributed by MTR, of Ford House, Cross Road, Bushey, Herts.

The mixer, which is designed for stage use, has level fader, (with peak indicator), treble and bass controls, foldback (pre), effects (post) and pan on each of its 12 channels. Two inputs are supplied, for line or mic., and there are a further two sets of inputs for two phono units. Outputs are L and R, while there is mono out for foldback. On the master section is a stereo 5-band graphic equaliser, twin VU meters, effect return control, a horizontal pan fad fader (plus an extra one for phono mixing) and 2 stereo disc volumes in addition to the left and right master faders.

Thoughtfully, a headphone socket is provided, with volume control and the compact unit is designed so that one operator can control all units, and ensure the connections are true, without tedious circumnavigation of the desk.

The Cutec 12/2 is £358 inclusive, and details are available from MTR, Ford House, 58 Cross Road, Bushey, Herts, WD1 4DQ. Tel: Watford (0923) 34050.

Two very low cost guitars and a range of low cost amplifiers are also set to be introduced by British Music Strings this month. The Kay electric guitar will retail for around £79.95 inc



VAT, while the bass version will cost just £89.50. The guitar features three pickups on the traditional shape, Schaller copy machines and standard hardware, trem, and three pickup selector.



The new amplifiers are also Kay. The K30 combo is £69.50, the K50 is £89.00 and the K50B (bass) £99.00. They also have a top of the range mixer combo, The Londoner, which features two sections – one for organ/bass, and one for guitar (lead or rhythm). A master volume and presence is included, as are bright and normal inputs on both channels. The guitar section additionally features parametric Eq, and reverb. Rated at 100W, the Londoner will retail for £176.50. A new budget price electric piano has just been released by Jen, distributed in the UK by British Music Strings. The Jen Piano 73 is touch sensitive and ranges across six octaves. It contains piano, clavichord, spinet, bright and mellow presets with the addition of phasing and vibrato effects. These two effects are variable, the phase

speed and the vibrato depth under control.

A 20W internal amplifier is fitted, with two speakers for home use (it also has a headphone out), but offers a PA out for stage use.

The Jen Piano 73 is available for around £345 inc. VAT, sustain pedal, chrome stand and cover.

Details are available from British Music Strings Ltd., Bedwas House Industrial Estate, Bedwas, Newport, Gwent.

Korg are to introduce a new metronome into the UK in late February, through their UK distributors, Rose Morris.

The KM-50 is an electronic metronome, with a pendulum arm, and 2 tone sound generation. A quartz crystal oscillator generates the reference frequency, and in this way, the unit may also be used as an electronic tuning fork.

A meter and reference frequency selector allows the user to switch between 2,3,4,5 or 6 beats per measure, while this same control switches between 439, 440, 441, 442, 443 or 444Hz (for middle A) in the frequency mode.

The tempo control allows the setting of the number of beats per minute, while tempo can be indicated by both pendulum and sound, or by sound only. An earphone jack is fitted, which cuts out the main speaker when in use.

The KM-50 can be used on battery or mains (a special adaptor is available), and the tempo range runs from 40-208 BPM. The makers claim an accuracy of $\pm 0.04\%$.

Priced at £59.95, details are available from Korg, Rose Morris and Co., 34 Gordon House Road, London NW5.

John Hornby Skewes recently introduced a new, low-priced, digital delay unit, *The Digitec S1024* to the UK. The unit offers a delay time variable from 1ms to 1,024ms over a full bandwidth.

A low frequency oscillator, variable through 0.1Hz to 10Hz gives precise speed and depth controls of modulated effects such as ADT, Chorusing, Flanging and Phase. A feedback control, with a switchable hi-cut filter and modulated delay is also available. Bypass can be facilitated either through the switch on the frontpanel, or through a patched footswitch.

The S1024 features a hold circuit, which allows the storage of up to 1,024ms of information for constant repeats with no drop in signal quality. A VU meter gives indication of the input levels, maximising signal to noise, and reducing distortion to a minimum.

Freestanding or rack mounted (19") and will retail for around £275 inc, and further information is available from John Hornby Skewes & Co. Ltd, Salem House, Garforth, Leeds LS25 1PX.

Please note: A full review of the JHS Digitec S1024 will appear in the March issue of E&MM.

A new low cost transistor tester, the Model 4500, is the latest addition to the 4000 Series of hand-held testers, from Osborne Electronics.

The self-contained unit simplifies the testing of P.N. junctions of discrete semi conductors (whether they are in or out of circuit).

PNP or NPN transistors, diodes and open or short circuits junctions can be identified with the unit – even up to 270 ohms or 33 microfads. The 4500 measures 32 x 22 x 100mm and weighs around 75 grams.

Prices are £16 for a single unit, but there are reductions for larger orders (ie: £12 each for orders over 11).

Details from Osborne Electronics, Binstead Road, Ryde, Isle Of Wight.



effect, but after a while I got an ARP sequencer, which is brilliant, a great tool.

You see I can't really play keyboards, so the sequencer was like a dream come true. There was very little information supplied with it though, and there was no magazine like *Electronics & Music Maker* around to tell you what to do! I just experimented, putting a click-track down on tape and then building up layers and layers of sequences. A good effect you can get with the ARP is to put a tune in it, say a brass riff of eight notes over sixteen steps, and just switch it into 'random'. You get an amazing free form solo, just using those notes! I've used that on quite a few records, to be honest.

The micro-composer is another big step on from that. I use it a lot in certain ways - I love working out random things on it, using it in that sort of way. I think they're more useful for people who are actually songwriters, like Martin Gore (of *Depeche Mode*) and Vince Clarke (originally in *Depeche Mode*, then in *Yazoo*, and now in *The Assembly*), they really use them a lot.

I feel most at home with modular mono synths like the ARP 2600, the RSF Kobo!, and the Roland 100M system. I don't normally use a keyboard with any of those, as I tend to control them with the MC4 or the ARP sequencer. I do sometimes use the Roland polyphonic keyboard with the 100M system, setting up different sounds on each channel to get strange effects.

What I dislike about non-modular polysynths is that generally speaking they're programmable, which tends to stop you thinking for yourself. Instead you end up just going through the programs to see what sounds good. It's very difficult to start from nothing on something like a Jupiter 8.

PPG

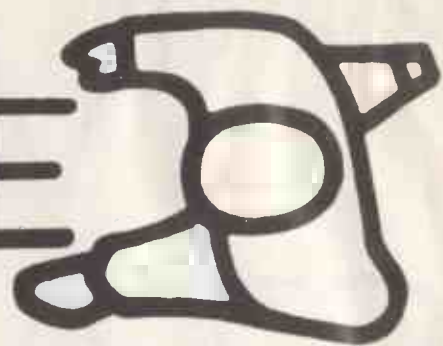
At first I was really excited by the PPG Wave, because the sound and the way of manipulating it was so different from anything I'd used before. We used it a lot for bells and things, and the first thing we used it on was 'See You' which I think was pretty early for one of those. There were problems though: we could never get the sequencer to sync up properly, and it became unreliable on the road.

PPG were a bit naughty actually, because when we bought the Wave 2 they told us that it was fully expandable, and that when we wanted to upgrade it we'd be able to. What they actually did was to bring out the Wave 2.2 which superceded ours completely. That meant that the Waveterm, when it came out, wasn't compatible with our Wave at all. The PPG is basically just not working any more, but that isn't as bad as it sounds because it's been around the world about three times on tour with *Depeche Mode*, on and off planes.

Sampling

We used the Emulator a lot on the last *Depeche Mode* album, *Construction*

MUTE RECORDS



tion Time Again, not for strings or brass, because that seems really pointless to me, but for sampling metal sounds, music boxes, all sorts of things. Also we got a Synclavier about half-way through the recording. We used it a lot, but we had to learn as we went along.

It's a brilliant instrument once you get into it. We used that for sampling, and for digital synthesis. It's really easy to use: you switch it on and you've got the library of digital sounds which are great - some really good sounds. (Back to the preset trap again!) It's really good for percussion, synthesised sounds and sampled ones too, because of the amazing quality. I'm just at the moment getting into using the sequencer, organising the files on it and composing with it, mainly using the synthetic percussion sounds.

For percussion we used the Drumulator mostly, for bass and snare sounds, and also the ARP 2600 for tomtoms and loads of other percussive effects. I think it was good to use the

Drumulator, because up till then we'd always used completely synthetic percussion set-ups, Simmons and things. We actually treated the Drumulator sounds quite heavily with ambience though, we didn't use them straight.

Reverberation

I prefer using live rooms for ambience now. Recently I've been working with an engineer called Gareth Jones who's very into recording that way. He helped set up John Foxx's studio - *The Garden* - which is where we recorded.

The main room there is quite small but incredibly live; we had two Tannoy Little Red monitors and a Peavey amp in there, constantly on sends. We had four stereo mics on those, placed at different distances, so we could tap in to various ambiences. We also had an H/H amp in a tunnel they have there which goes under the road. It's great working that way, you get really new, exciting sounds."

E&MM



MARK STANWAY

Keyboards with Magnum and Phil Lynott

How did you get started on keyboards?

I'd always been interested in music, but I'd never really played an instrument. I'd messed around a bit with guitar but never seriously. My father was a drummer, so I was brought up on swing and jazz. Of course the piano was quite a prominent instrument in that type of music so when I was twenty and I decided I wanted to play in a band, the piano was the instrument I chose. I'd been through university (nothing to do with music) and I decided that was what I wanted to do. So I just started to play, teaching myself.

What was your first keyboard?

In 1975 I bought myself my first electric piano which was a Rhodes, and I still like them a lot. They've got a certain sort of sound and for some things they're unbeatable. I've tried Wurliizers which are also nice, but I'm really heavy handed on a piano so I ended up breaking that many reeds that it just wasn't feasible to take one on the road.

My first synth was an ARP Explorer, only a mono thing, but it was great fun and a good introduction to the basic fundamentals. It gave me an insight into synthesiser sounds. As better things came out, I'd try and afford them and I ended up getting a MiniMoog, which is still one of my favourite instruments.

What are you using at the moment?

Well I swear by the Oberheim (OB-Xa, the one with 120 memories). It holds its tuning so well and it's never let me down. When I was in Sweden last month, I used the new OB-8 (reviewed in this issue) and it's got a few developments which are really good so I wouldn't mind moving up to that one. I think they ought to give me one really, but I suppose I'll have to fork out.

What is your set up?

Well from the left round I've got Mellotron – still. It's a dear old instrument. I only use it on one track in the current (Magnum) set, just for the male voices which I can't get from anything else.

On top of that I've got the Korg organ, the BX-3. You see, I don't play enough organ in the show to warrant lugging a Hammond B3 about, and this is the nearest I can get to. It's a great thing, so compact but with a really full sound.

On top of that I have a Roland string machine, one of the old ones, the RS-202. I still use it in the studio, on the most recent Magnum for example (the Eleventh Hour – reviewed in E&MM Aug 83) and I'll continue to use it, 'cos it's got a great sound. I get a very thin sharp tone out of it, and using volume pedals and studio tricks on it, I can get it direct on one channel, with the delay panned to the other side.

I noticed on a couple of tracks on 'The Eleventh Hour' you got a great string sound, almost like a string quartet. Was that the Roland?

No, that was an Emulator, which we hired. That's a wonderful tool. I don't use one on the road, but the guy from Marillion (Mark Kelly – interviewed E&MM July 83) does and he's got whole string parts stored in the sequencer. I could quite get into that, it would leave me free to play the 'real' keyboard parts.

Then in front of me I've got the CP70 (Yamaha Electric Grand), and if you want a grand piano sound on the road, it's the only one to use. I've heard some good things about the Kawai, but I haven't tried one yet.

On top of the Yamaha, I've got the OB-Xa and I'm currently using a MicroMoog on top of that, which I use for bass riffs. It's very quick and easy to change sounds on.

Then on my right I've got the MiniMoog and another MicroMoog, which I use for wind noises, effects and things like that. It's rather convenient as it saves me doing too many sound changes in the set. Perhaps it's a bit of a luxury to double keyboards but it makes you more relaxed. Obviously the ideal thing would be if all the synths had programs. I'm working towards that but this is more comfortable for the moment.

I've just worked a deal out with Studiomaster. They're building me one of their desks, the 16 into 16, into a flight case, and I'll also be able to use it at home in a Portastudio situation. It's a great desk and it's actually designed to take a patch-field as well. Alongside that that they're providing me with their new MOS-FET amps, 500W power amps which will be the crossover that powers my back line.

You use back line amplification then?

Yes, but only for monitoring. I send a signal from the keyboard mixer straight to

the PA mixing desk. And soon I'll be able to send everyone separate mixes which will give me a lot more control. I don't like to be DI'd straight from the Instrument because everything I play goes through volume pedals anyway. It's the only way I can control things if I'm playing two keyboards at once, so I like the DI to come after those obviously. It means I'm actually doing half the job for them on the main desk.

Studiomaster make a great 4-track cassette recorder as well. If you read the spec on it, it's clearly superior to the Portastudios and multi-trackers around at the moment. I'm looking forward to working with that as well. These things are so useful for writing at home.

How long have you been with Magnum now?

Four years, but I've known the guys for much longer, nine years I think. Before I started with them, I was playing in a band called Rainmaker. That was really a musician's band and we were never going to get an album deal. At least we got a bit of respect from other players and we did enjoy the playing.

How did the Magnum gig come up then?

Magnum split up with their keyboard player and so they got in touch with me, asking me to go down and have a play with them. The rest is history! I've made two albums with them now.

Who else have you worked with?

I did Stampede's album, and more recently Robin George (currently guesting with Magnum). I've done three or four albums where Phil Lynott was involved and I've got my own solo project which I've had written now for over a year: I'm just waiting for the right players to record it with – the likes of Phil Lynott, John Sykes, and Brian Downey, who are exactly the sort of people I want to play with, not because of the names so much, but they are superb players. Anyway, John Sykes is one of my best friends.

I hope to see that coming out soon because everyone likes to see their solo work do well. Anyway, for the immediate future I'm tied up with Phil Lynott band, when the second of his solo albums comes out, so I'm going to be busy whatever happens.

Paul Wiffen

E&MM

FEBRUARY 1984

E&MM

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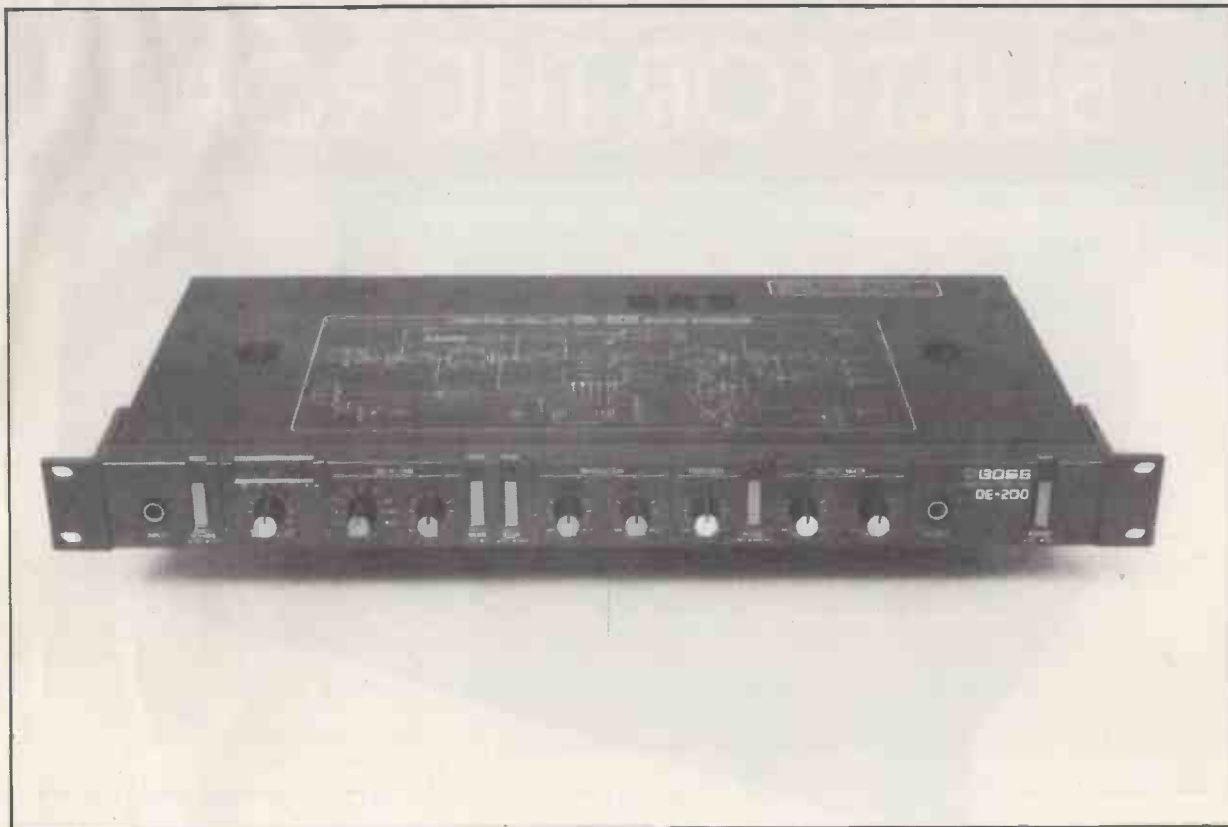
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Boss DE-200 Digital Delay



The latest digital delay from Roland subsidiary Boss offers all the standard performance functions associated with digital delay units of this type. It also has the capability to accept trigger voltages from a rhythm machine, so that you can use the DE200 as an external sound source: this feature makes the Boss unique in its class and price range.

The design and layout of the unit makes it a more applicable to studio use than to live stage situations. Considering that three separate controls are used for setting delay time and that the jack from the rhythm-sync needs to be physically removed from the back of the unit in order to return to normal delay function, it is somewhat cumbersome and limited in live work. Conversely, the inclusion of input/output jacks on the front panel which over-ride their companion jacks at the rear is only really necessary for stage work, as in the studio the unit would be rack-mounted and connected a patch day.

Controls

The delay time can be set between 1.25 and 128ms by three controls on the front panel. First, a rotary switch selects one of nine preset times from 2.5 to 640ms (each of these is double the previous one: 2.5, 5, 10, 20 etc). This can be continuously altered by a fine-adjustment sweep pot which at maximum is x 1 (preset value) and at minimum is x 0.5 (1/2 preset value). Thus you have fine control over a range of 1.25 to 640ms. Finally, a switch marked Mode x 1, x 2 doubles the result of the

previous two controls.

Modulation depth and rate, feedback and direct/delay outputs are all controlled by pots on the front panel. Dry, unmodified signal can also be obtained by switching the unit to 'bypass', which takes the signal directly from the pre-amp stage. Feedback phase can be inverted and Hold mode set by two switches, the state of which are shown by two LEDs.

The rear panel supports eight jack connectors for input, output and the rhythm-sync feature. There are three output jacks, direct (unmodified), mix (direct and delay) and invert mix (direct plus inverted phase delay). These outputs can be used to obtain stereo effect either with direct/delay or delay/invert delay. Two remote (foot-switch) jacks allow control of the Hold mode and bypass facility, over-riding their companion controls on the front panel. The two final jacks are for the rhythm-sync feature; Trigger In and Footswitch (DP-2), which acts as record start/stop when building up the sampled sound.

Uses

Boss supply sample settings in their instruction manual for effects such as flanging, chorusing and doubling, and also various echo effects. Generally, these effects are better than normal for this grade of equipment, although flanging is still a little weak compared to purpose-built effects units. Included

in the sample settings in 'Fixed Flanging' which uses inverse feedback with no modulation and a fairly long delay time. This gives a very bright signal, easily overloaded, which can be quite interesting. The suggested setting for 'Deep Echo' is rather strange; using the LFO at a slower delay rate creates some interesting effects, but to my mind Deep Echo is not one of them.

The lack of a simple on/off switch for the LFO means that to have a non-modulated signal the modulation depth needs to be turned to minimum. Once modulation is taken out the long delay echo facilities are very good indeed. Decay is very natural, without the sudden drops in signal strength and quality so often apparent with digital delay circuits, where badly clipped transients finally completely break down to clicks and sudden unnatural drops in volume. Boss have cured this problem by cutting down on frequency response, which is somewhat narrower than some other delays with 12 bit CPUs. Even so, the sound quality is quite acceptable even when using long delay times.

Rhythm-Sync

This feature allows for a digitally sampled signal to be stored in the Hold circuit and then triggered externally by a rhythm machine or any other trigger

voltage supply such as tape.

The unit is switched to Rhythm-Sync mode as soon as the jack is presented to the Trigger In socket at the rear. This sets delay time to max (640ms) which becomes the sample length for the record part of the operation. When recording, the positions of the fine delay pot and the mode switch do not have any direct effect on the recorded signal. On playback, however, they can be used for shifting the pitch of the stored sound. In this way the pitch of the originally sampled sound can be transposed up and down one or two octaves.

If Trigger Out from a rhythm machine is fed to Trigger In on the DE-200, the delay is triggered by the pulse of the rhythm machine, so that the delay output is set in sync with the rhythm machine. The signal to be delayed can be built-up in layers either by directly switching the Hold mode on and off as each voice is added (by footswitch or front panel control) or by footswitch to the DP-2 jack at the back. This allows for greater precision over timing of the recording as related to the rhythm machine, and gaps can be inserted between the trigger pulse and the start of the sound. Both these methods of recording/storing sounds can be supplemented by the audio output of the rhythm machine, but the sound can just as easily be built up normally in the Hold circuit and then applied to rhythm-sync afterwards.

This feature can give very effective results and can also be great fun, particularly when using a microphone as input, as it enables virtually any sound to be triggered and reproduced with surprising fidelity.

Construction

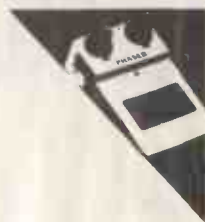
The unit is sturdily constructed with all component boards etc. being mounted on a strong steel framework. All switches and controls are very quiet in operation, keeping the signal free from mechanically-induced noise that can so easily cause havoc in this context.

As mentioned earlier, frequency response is a little narrow compared to other 12 bit delays: 10Hz to 10kHz when the Mode switch is set to x1 (max 640ms), and 10Hz to 4.5kHz in x2 mode (max 1280ms). This can give a little falseness to the quality of the reproduced sound at slower delay times. THD is rated at 0.25% and although no signal-to-noise specification is actually listed, the sound is generally clean and free from unwanted noise.

Conclusion

Generally the Boss DE200 is one of the better digital delay units in this price range, with natural-sounding decay and delay-related effects that are as good as any in its class. The added rhythm-sync facility adds a great deal of versatility and opens up many

EFFECTS REVIEW



original and creative avenues. The only major moan I have about the DE-200 is the lack of a simple on/off switch on the front panel for the rhythm-sync mode. As long as a plug is in the rear panel connection delay is set to 640ms and can only be operated by trigger signal to that jack. This idea defeats the whole object of using a patch bay with rack-mounted equipment, and in live use one is faced with the decision of either normal delay or rhythm-sync, as the two cannot be used simultaneously.

However, the rhythm-sync facility is still well worth having, and is particularly useful if you want to add externally sampled percussion instruments to the output of a rhythm machine.

Glenn L. Hughes

E&MM

The Boss DE-200 retails at £299 including VAT, and Roland (UK) at Great West Trading Estate, 983 Great West Road, Brentford, Middx. should have further information. Alternatively you can contact them by telephone on 01-568 4578.



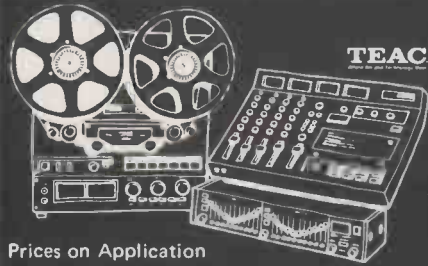
Eddie Moors Music

679 Christchurch Road, Boscombe, Bournemouth. Tel: 0202.35135.

.. 302509.

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Frankfurt Musik Messe 1984



For those who have never visited the Frankfurt Music Messe, the attention graced upon it by the British Music Industry would seem a little overblown. Airport lounges choked with migrating retailers manufacturers, journalists and the attendant masses lead into a stay at one of the largest single rooms in Europe. Halle 5, Halle 6 and the various other areas of the exhibition add up to an area around five times that of the Wembley pitch. Onto this vast space are placed a myriad of stands, with exhibitors from literally all over the world, while the interested flock to view the latest innovations.

1981 saw the Frankfurt Fair at a low ebb — though the British contingent showed spirit and some excellent new products, and some lowered prices to care for the reduced spending powers of the foreign competitors.

1982 was a little different, the Americans making some inroads, and the synthesiser developments taking more attention (at last) from the incredible numbers of 'copy' guitars. Personal keyboards were also there in 1982, but their potential in the 'serious' music stakes was all but dismissed.

Allen & Heath Brenell

69 Ship St., Brighton, Sussex. AHB, as they are affectionately known, will be displaying their collective force in all types of recording equipment. Including the famous Allen & Heath mixers and the Brenell series of recorders. In addition, they will have a selection of their accessories for multitrack recording, and PA mixing.

Alligator Amplification

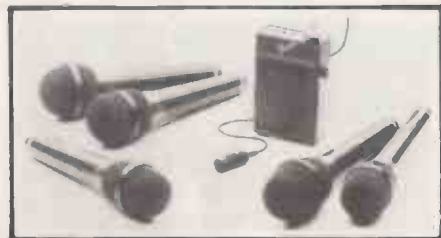
176B Field End Road, Eastcote, Middx. Under the auspices of the Musicians Direct Supply company, Pete Tulett and associates will be demonstrating the Alligator range of combo and back line equipment. The wide range of guitar, bass guitar, keyboard and general purpose amps and cabs will be on display, as will a new guitar... of which full details will appear in March E&MM.

Atlantex Music,

1 Wallace Way, Hitchin, Herts.

Carlsbro Sales Ltd.,

Lowmoor Industrial Estate, Kirkby In Ashfield, Notts.



CBS/Fender

Fender House, Jeffreys Road, Enfield, Middx. EN3 7HE. Tel: 01-805 8555.

Always a popular stand at exhibitions, Fender continue their trend of showing new equipment at fairs and exhibitions and will be showing a whole new selection of products at Frankfurt. The largest of these

The order books were filled, but the expectations of many of the exhibitors there was one of resignation to a world market that would take some time to recover.

1983 however showed some signs of life. The European markets regained some of their previous buoyancy, and the products that really were 'neu!' (and not just 1982ers with a new fascia panel) were exciting. Midi showed its face and caused a stir, the Steinberger was accepted, the Yamaha developments (kept fairly close to the chest previously) were shown to great effect, and the British contingent took their share of the attention with an impressive display that featured the best of British speaker manufacture and sound equipment. Again, home grown keyboards and guitars were thin on the ground.

This year, the Fair looks set to regain some of its former glories. The equipment listed below that will be shown there is new, and can be seen to be a step on. Foremost in the flag waving stakes are MPC with the Music Percussion Computer, and their new stage pads, the revitalised Vox range, some exciting new products from Soundtracs and... well, lots of everything!

is the Fender Pro Range of sound equipment, including powered mixers, mixers, three speaker systems, power amps, and three new microphone series.

On the guitar front, they will be showing the new Elite Series, and also some new products under wraps at press time. These are rumoured to include some semi acoustic guitars, and a range of set neck solid body guitars.

Beside these will be their recent models of Standard Series guitars, Sidekick Amps, and the Hi Tech and All Tube ranges of amps.

Cerebrum Lighting

168 Chiltern Drive, Surbiton, Surrey. Tel: 01-390 0051

EFS Celco memory lighting desks, and special lighting boards for pro lighting applications, Thomas stage lanterns and accessories (Par 36, 46, 56, and 64 models) and trussing, plus Powerdrive speaker and lighting stands are just a few of the many lighting items that will be on show from Cerebrum.

Cliff Electronic Components Ltd.,

97 Coulsden Road, Caterham, Surrey GR3 5NF. Tel: Caterham 47713.

Manufacturers of a wide range of accessories and components, Cliff will be exhibiting jack sockets and plugs, faders, low cost knobs and allied units, a new range of Electronic solid state Bargraph displays and Vu/PPM meters, plus a wide range of cables and XLR connectors.

Cliff also manufacture a huge selection of cabinet fittings and finishings, such as corners, handles, recessed plates, loudspeaker and baffle clips and clamps, metal speaker grilles, terminal strips, various sizes of cabinet feet, power sockets and frequency equaliser components. All are illustrated in their new catalogue — available from the address above.

Court Acoustics

10-16 Mercer Street, London WC2. Tel: 01-240 3648

This is the first time that Court have been at Frankfurt — this time if coincides with their 10th anniversary. On show will be the Proflex range including the 350 (new model). 200 and 100 models, plus the System 7 range, and the TRM3 full range cabinet. On the electronics side they will have the GE60 and GE30 graphic equalisers, balancing boxes, hi and lo Z boxes etc. They are also supplying the sound for the Simmons Electronics stand. Lighting on both is by Theatre Projects Lighting Hire.

Custom Sound

Audio House, Robln Lane, Pudsey, Leeds LS28 9HV

Custom Sound will have their largest ever stand at this years fair, to display the full ranges of Roost, Custom Sound and Trucker amplification, plus some very new additions. The new 727 Keyboard Combo offers 100W in a specially designed unit for stage use, while from Roost there will be a new selection of valve amps with cabs. The Trucker range of combos will also be there, including the 45W compact Truckers, in a selection of speaker sizes.

DSN Marketing (Vitavox) Ltd.,

Westmorland Road, London NW9 9RJ. Tel: 01-204 7246.

Vitavox will be unveiling a new range of speaker systems and components at this years fair, including The S5, a compression driver with a rating of 60W and featuring an aluminium voice coil; The Blacknight, a high power phase aligned horn loaded flying system. This has a 15" LF driver loaded in a flare, a 10" mid range driver and the new S5, the unit is triamped. The Flyingboxer is a three way 600W cabinet with 15" and 10" cone drivers, plus a music motor compression driver. It has been designed for monitoring work.

Fane Acoustics Ltd.,

286 Bradford Road, Batley WF17 5PW. Tel: (0924) 476431.

Fane Professional, the pro audio side of the Fane Acoustics Ltd, will have an enlarged stand at the fair, with a special sound proof booth where customers will be able to evaluate the full range of Fane products. In addition to their existing range of studio professional 10", 12", 15" and 18" chassis speakers, they will also be introducing 5" and 8" high power chassis units, a 24" high power 8 ohm sub woofer, a bullet super tweeter (the ST5022 — a development of the ST5020), a new HF horn driver the CD400, two constant directivity horn flares, and a full range of speaker grilles for all their products.

They will also be showing a range of professional crossover units, and a range of pro speaker systems, including two extended range studio monitors.

General Music Strings

C7 Treforest Industrial Estate, Pontypridd, Mid Glamorgan CF37 5UF. Tel: Treforest (044 385) 2571 or 2098.

Utilising a sound booth on their stand, GMS will be showing their new stainless steel guitar strings, that were designed and constructed in conjunction with *Electric Wood Ltd* – the manufacturers of the *WAL* series of bass guitars.

P+N Stands will also be on the GMS Stand and they will be showing both microphone stands, and keyboard stands, the new models of which, the 377, takes two keyboards and retails for around £29.95 inc.

Terry Gould International

The Old Crown, Bugbrooke, Northampton NN7 3RF. Tel: (0604) 831185.

A new range of safety belt guitar straps are on offer from TGI, made from English saddlers leather. These have a locking device made from leather and several patents are pending on this invention.

Terry and Linda Gould will also be displaying a wide selection of accessories for guitars and drums.

Adam Hall Supplies

Unit 3, Carlton Court, Grainger Road, Southend on Sea, Essex SS2 Tel: 0702 613922

Cabinet fittings, case hardware, passive crossovers, ASS horns, rack equipment, and a wide selection of accessories will be on show.

James How Industries

20 Upland Road, Bexleyheath, Kent. Tel: (0732) 450838.

After many years apart, *Rotosound* and *Superwound* have now amalgamated under the James How banner.

With a massive selection of strings between them, they will be launching a new range of 'Funkmaster' bass strings, Double Six twelve string sets in light and super light gauges, and a new line in double ball end strings, for use of the *Status* and *Steinberger* ranges of basses and guitars.

Leech Manufacturing Co.,

Broughton Road, Salford, M6 6AQ.

Leech will be exhibiting a large number of speaker enclosures for a myriad of applications. PA stacks from 100-3W will be on show, in addition to backline equipment for specific instruments. Cabs from Leech are available either loaded or unloaded.

A new attraction will be a special compact plywood 200W cab and a new 100W 1 x 10 + Horn cab.

Martin Audio,

54-58 Stanhope Street, London W1.

McKenzie Acoustics Ltd.,

Albion Drive, Thurnscoe, South Yorkshire S63 0BA. Tel: (0709) 898606.

Among the many types of chassis speakers and allied products, McKenzie will be unveiling a new 10" drive unit at the show.

The HE 10 200 is capable of 200W RMS and will be shown alongside some new pressure die cast aluminium chassis, which has been designed to improve their *Disco* and *Studio 12"* models.

On hand to offer information and advice will be Glyn Baxter and Kevin Mart.

MTR

Ford House, 58 Cross Road, Bushey, Herts. WD1 4DQ. Tel: (0923) 34050.

The *Cutec* range of recording equipment, including the MR402 four track cassette recorder at £450, the dual digital delay, 12/2 mixer, power amps and graphics: *Shiino Vesta Fire* studio and stage effects: *TC Electronic* parametric equalisers: *Star Sound* low cost mixers and; *Aces* crossovers, graphics, reverb units, and low cost power amplifiers (1000W £454) and multi-

track mixers and tape recorders, are just a few of the many lines that will be on the MTR stand this year. Tony Reeves has also lined up an impressive array of new products including new *Cutec* Digital Delay, 12/2 mixer, variable crossovers, all valve pre amplifiers, rack mounting disco and broadcast mixers, new *Shiino* effects including digital delays and introducing the new *Shiino Kozoh* digital delays and aural exciters. Some new amplifiers and combos from *McGregor*, plus their own *MTR* range of mixers (6:4:2 £226, 12:8:2 £320) complete their stand.

Musimex

33 Church Crescent, London N20 0JR. Tel: 01-368 2716.

Musimex have expanded the companies that they represent, and this year will see

MUSIK MESSE FRANKFURT

Premier Percussion

Blaby Road, Wigston, Leicester.

A massive stand will hold many of the drum and drum accessories that Premier are famous for. They will be showing a new selection of Resonator equipment and drumsticks.



them exhibiting *Armstrong Effects*, *Bandive* mixers and digital sound processors, *Electrospace Developments* Time Matrix, the *Status* range of six and bass guitars, *MPC's* The Kit and the Music Percussion Computer plus *Reunion Blues* leather bags and cases.

They will also be showing *Burman*, *Trace Elliot* and *Session* amplifiers, plus *Tubby* Drum pickups and synth systems. Both Tony and Derek Morris will be in attendance, along with Pam Morris and representatives of their individual companies.

Ohm Amplifications,

Parkgate Lane, Knutsford, Cheshire

Piano Manufacturers Association

c/o Ramsdens, 22 Beach Road, Lowestoft, Suffolk. Tel: (0502) 62819.

While the PMA will have a small stand at the fair, they will not be exhibiting any products, leaving that side to their many members. The PMA forms a contact organisation for all types of piano makers.

Promark

PO Box 1, Ely, Cambs. Tel: (0353) 61124.

A new name on the pro audio and recording front, Promark will be exhibiting their new MX3, a home studio multitrack mixer with a wealth of facilities including mic and line in, balanced lines, direct out, overload indicators, 3 way EQ sections, 2 aux, linear faders and pan tape returns. All this is in the 8:4:2 configuration.

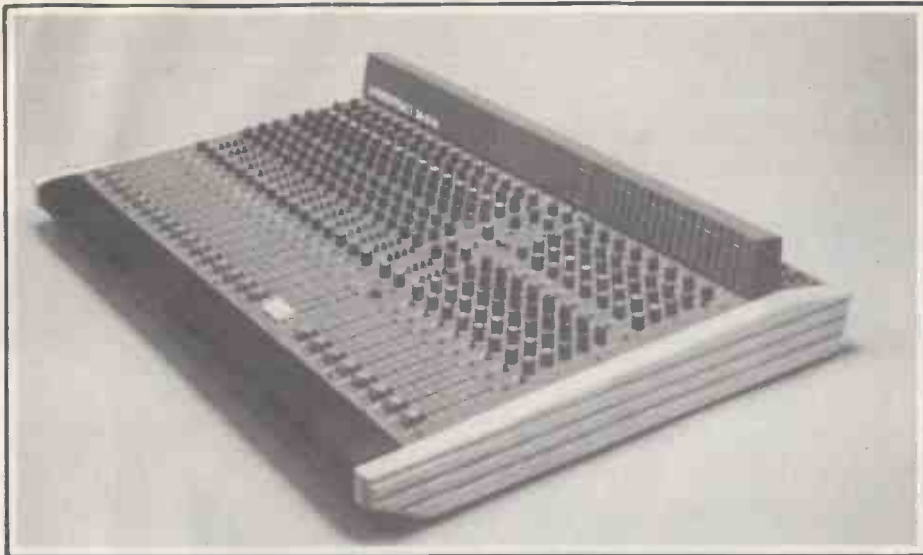
Other products will include their pro-power amps (MOSFET), 3 and 2 way stereo crossovers and 27 band and dual 11 band graphic equalisers. (A brochure of all the Promark range is available from the address above).

Recording Studio Design

Alcock Works, Chaul End Lane, Luton, Beds. Tel: (0582) 596674

A massive selection of their mixers for all types of applications will be on show this year, in addition to their new News Gathering Mixer, MOSFET power amplif-

MUSIK MESSE FRANKFURT



Soundtracs

91 Ewell Road, Surbiton, Surrey KT6 6AH.
Tel: 01-399 3392.

Since May 1982 Soundtracs have been developing the first English Digital Mixer. Of modular design, the CM4400 includes a microprocessor controlled routing system, and is also interfaceable with any personal computer.

The Soundtracs stand will also display a simulated studio control room to show off their 16:8:16 and will have displays of the many other mixers and allied products that they manufacture.

John Hornby Skewes Ltd.,

Salem House, Garforth, Leeds LS25. Tel: (0532) 865381.

Odd one out here, because JHS will not actually be exhibiting at the fair – but they will be all there! Members of their sales teams will be stationed on their suppliers stands: with a large contingent on the Kawai stand, the IMC (Hondo) stand and the Eko (organs) stand.

Soundcraft Electronics Ltd.,

5-8 Great Sutton Street, London EC1. Tel: 01-253 6988.

A very wide range of mixers and multitrack equipment will be on show from Soundcraft, including their Series 200 portable mixers, in 8, 16 and 24 configuration, and they can be used to provide either two stereo outputs, or four mono, making them suitable for PA and recording.

The Series 400B will also be there, in two formats. The 400B standard, designed for pro live mixing, and for home recording, and the 400B Monitor, designed primarily for monitor mixing.

In addition they will be showing the Series 800B modular system, The Series 4 – which is expandable up to 40 inputs, and their low cost producer packages (which will be on the AKG stand).

Turbosound,

202-208 New North Road, London N.

Yamaha

Mount Ave, Bletchley, Milton Keynes MK1.
Tel: 0908 71771

Yamaha Europa's stand at the Fair will tend to reflect some of those items that were shown for the first time in the East at the Tokyo Fair in the Autumn. They have promised certain new MIDI and DX compatible computer items, which are being kept under wraps.

They will have a new digital delay system, some new combo amps, and the KS15 and KS25 keyboard monitors.

Centre stage, of course, will be the DX series of keyboards, as well as some new additions on the guitar front. They will also have a large display of their drums and accessories.

Zildjian

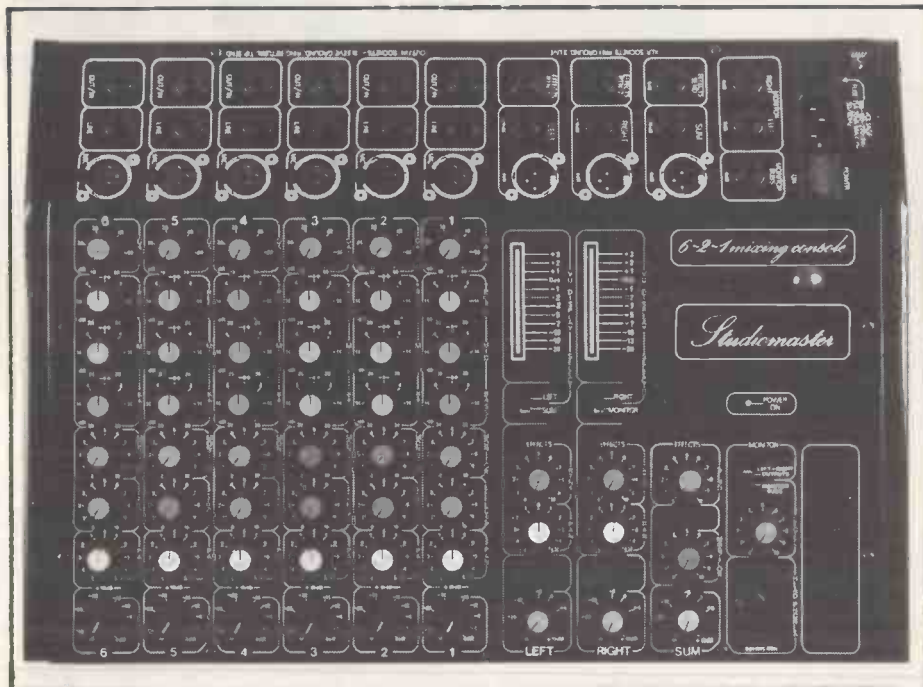
15 Sheet St., Windsor, Berks. Tel: 07535 59931

A cymbal testing room forms part of the Zildjian stand, where they will be displaying some of their many cymbals and accessories.

iers, and the popular *Studiomaster* guitar combo.

On the stand will be Jason Larson (Marketing Director), Mark Jones (UK

Rose Morris will also show, *Berg Larsen Mouthpieces*, *James Galway Whistles*, *Dulcet Chime Bars*, *Limpet Practice Pads* etc.



Marketing Director) and Carol Chaffee (Asst. Marketing Director).

Rose Morris

32 Gordon House Road, London NW5 1NE.
Tel: 01-267 5151.

The new *Vox Venue* range of restyled amplifiers and combos will be on view, including the *Keyboard Venue* (500W, 15" speaker and horn), the *Lead Venue* (100W, 12" speaker), the *Bass Venue* (100W, 15" speaker) and the *Vox PA Venue* (120W) and the specially designed speakers that accompany it, rated at 80W each.

Also on show will be the *Vox* range of guitars in a new styling, which are to be called the *Vox White Shadow Range*.

Rosetti Ltd.,

138/140 Old Street, London EC1V 9BL. Tel: 01-253 7294.

Pride of place on the Rosetti stand will be their range of Pro Amp amplifiers, including the *Viper* and *Venom* combos, and the latest addition to the range – the 15W *Demon* combo which will be available in reverb and non reverb models.

Especially exciting is the new range of accessories to link with the *Seiko* range of keyboards.

Simmons Electronics,

Abbey Mill, Abbey Mill Lane, St. Albans, Herts. AL3 4HG.

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ROLAND JP8 Jupiter 8	£2500
ROLAND JP6 Jupiter 6	£1495
ROLAND JX3P	£675
ROLAND PG200	£150
ROLAND MC202	£255
ROLAND Juno 6	£565
ROLAND Juno 60	£869
ROLAND CSQ100 Digital Sequencer	£125
ROLAND CSQ600 Digital Sequencer	£195
ROLAND TR808 Rhythm Composer	£550
ROLAND TR806 Drumatix	£179
ROLAND TB303 Bassline auto bass	£199
ROLAND CR5000 Compurhythm	£255
ROLAND CR8000 Compurhythm	£325

Amplification	
ROLAND JC-50 1x12" 50w	£250
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ROLAND C-20 Cube 20	£125
ROLAND C-40 Cube 40	£169
ROLAND C-60 Cube 60	£185
ROLAND C-100 Cube 100	£275
ROLAND C-60B Cube 60 Bass	£210
ROLAND C-40 Cube 40 Keyboard	£180
ROLAND C-60K Cube 60 Keyboard	£239
ROLAND C-40CH Cube 40 Chorus	£175
ROLAND C-60CH Cube 60 Chorus	£210
ROLAND BOLT 30 Valve 30w	£250
ROLAND BOLT 60 Valve 60w	£325
ROLAND BOLT 100 Valve 100w	£525
ROLAND SPIRIT 10	£71
ROLAND SPIRIT 30	£145
ROLAND SPIRIT 50	£185
ROLAND SPIRIT 30B Bass amp 30 watt	£149
ROLAND SPIRIT 50B Bass amp 50 watt	£195
ROLAND SPIRIT 15B Bass amp 15 watt	£105
NEW!! ROLAND SPIRIT 25A Guitar amp 25 watt	£115
NEW!! ROLAND HK20 Home Keyboard amp 20w	£92
ROLAND PA-80 6ch. mix amp	£325
ROLAND PA-150 8ch. mix amp	£475
ROLAND PA-250 8ch. mix amp	£555
ROLAND SST40 Speaker cabinet 40 watt	£135
ROLAND SST60 Speaker cabinet 60 watt	£165
ROLAND SST80 Speaker cabinet 80 watt	£195
ROLAND SST120 Speaker cabinet 120 watt	£399
NEW!! ROLAND SDE3000 Digital delay 4.5 sec programme delay on 8 channels	POA
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BOSS DS-1 Distortion	£42
BOSS SD-1 Super Overdrive	£59
BOSS GE-77 band graphic	£59
BOSS GE-10 10 band graphic	£83
BOSS NE-1 Noise Gate	£39
BOSS OD-1 Overdrive	£45
BOSS PH-1 Phaser	£51
BOSS PH-1 Phaser w. resonance	£59
BOSS TW-1 Touch Wah	£79
BOSS DM-2 Delay	£48
BOSS OC2 Octaver	£53
BOSS VB2 Vibrato	£53
NEW! BOSS HM2 Heavy Metal compact pedal	P.O.A.
NEW! BOSS PC2 Percussion synthesiser	£52
NEW! BOSS HC2 Hand Clapper	£52
BOSS RX-100 2chan. reverb box	£101
BOSS DM-100 2 chan. analogue delay	

+ chorus	£135
BOSS DM-300 Stereo analogue delay + chorus	£179
BOSS FV-100 Guitar monovol. pedal	£44
BOSS FV-200 Keyboard Stereo Vol. pedal	£53
BOSS PD-1 Rocker Distortion	£55
BOSS PW-1 Rocker Wah	£
BOSS PV-1 Rocker Volume	£69
NEW! BOSS HA5 Playbus headphone amp with stereo chorus & headphones	P.O.A.
BOSS TU-12 Guitar Tuner	£31
BOSS DB-33 Dr Beat	£52
BOSS DR-55 Dr Rhythm	£79
NEW! BOSS DR-110 Dr Rhythm	P.O.A.
BOSS KM-22-1 mixer pre-amp	£19
BOSS KM-15 Junction Box	£18
BOSS J44 Junction Box phono mini-RCA	£16
BOSS KM-04 Compact 4-1 mixer	£36
BOSS KM-606 channel	£225
BOSS KM-400 4 chan. Keyboard mixer	£59
BOSS KM-606 6 chan. Keyboard mixer	£89
BOSS MA-15 Monitor amp 15w	£55
BOSS MA-5 Monitor amp 5w	£33
BOSS MA-1 Mascot Amp	£28
BOSS FA-1 FET Amp	£65
BOSS MS-100 Monitor Speaker 100w	£19
BOSS MSA-100 Microphone stand Adaptor for MS100	£19

(Add £1.50 carriage per item)



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Yamaha MM30 Mixer £169



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CS70M ex-demo	£3859	£795		SAVE UP TO AN AMAZING 80%

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Micro-Monophonic Synthesizer
CS01



32 keys (F2 ~ Cs)
Controls: LFO, Glissando, VCO, VCF, VCA, EG, Wheel (Pitch, Modulation), Breath Control (VCF, VCA), Volume
Battery (1"R6" x 6) or AC Adaptor
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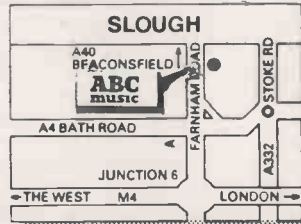
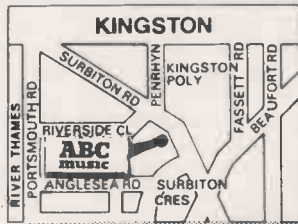
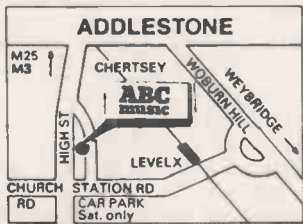


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CUBE



Chorus 60

The Roland range of Cube amplifiers were greeted with open arms when they were first introduced into the UK around four years ago. Bass players and keyboard players alike flocked to the call, and very soon afterwards the guitar world came around and took them to their hearts. The boon is that they are small, they are loud, and they have a myriad of controls, inputs, outputs and sounds to suit almost all tastes.

The Roland Cube Chorus 60 is 43H x 37W x 23D (cm approx) making it a very small amp for the power rating. Indeed, the speaker is Roland's own – a 30cm model on a staggered mount that is recessed from the cloth front panel giving added protection should the unit fall facewards. The construction of the cabinet is the usual Roland robustness, with 1.5cm thick board used throughout, with panel blocks supporting the construction. The board is covered with lightly grained grey Vynide with hard plastic corner pieces and feet, and a folding (comfortable!) carrying handle atop. The beautiful silver/black speaker grilles used add much to the cosmetic approach to the Chorus 60, and the controls are recessed into the back of the top panel – a design that should prevent most accidents. The back of the cabinet is formed half from the amplifiers' metal backplate (with massive logo), the patching sockets, and a removable section of board that gives access to the speaker section.

Taking it from the top, the controls are (seen from back, L to R) two inputs, marked Overdrive and Normal, then seven rotary controls for Overdrive, Volume (pull Bright), Master Volume, Bass, Mid, Treble and Reverb. Two switches are placed on the right: Reverb (three position), and Chorus (two position).

While the printing of the legends is bright and clear (though they can be easily scratched) they are, seemingly, the wrong way round. When the amp is viewed from the front, as it would be in performance, the legends are upside down. A minor point – but a niggle nevertheless considering the attention to details on the rest of the Cube.

The socket bank on the rear panel consists of: three footswitch jacks for Overdrive, Chorus and Reverb, an output for Chorus/Reverb to an external amplifier, a Pre out for connection to a tape deck or PA system, a Main In jack which allows an effects unit to be set up between Pre Out and Main In, an External Speaker jack (for connection to an impedance of more than 8 ohms and, finally, a headphone jack which cuts out the main sound – ideal for mid gig tuning, or for private listening.

And so to the sounds. The two inputs offer high and low impedance as well as the choice of distorted or clean sound. Using the normal input, the overdrive cannot be induced – but conversely, using the overdrive input and the footswitch, the effect can be removed. The sound from the overdrive, while it sustains very well, isn't really a valve sound. It has some of the qualities certainly, but there is a certain harshness here that sets the teeth on edge. The soft overdrive is a warm rich sound, but any



attempt to harden this up seems to increase the harshness. But, and it is a big but, when the Pre Out jack was taken to a PA system the overdrive sound was far better than most miked up cabinets – no spill or howl there – just an excellent distorted sound that allows for long, sweet sustain.

The Volume control varies the input levels (and it can be pulled up for an added treble sound), this is thoughtful and, when used with the Master Vol, gives a greater level of control over the sound that is usual. The three tone controls are quite forceful in their ratio to the sound – the treble especially needs a light fingered approach or the sound can change quite dramatically, while the middle and bass controls added the richness that the Cube range is known for. (Though it is worth trying to put the overdrive on half up and taking the bass and mid out – instant Clapton!).

The reverb sound can be switched three ways, when the Chorus/Reverb out is connected to another amp. This gives you Dual sound (reverb to both), Off and Extension Only. Giving a pseudo stereo reverb, you can then place the Pre Out and the Chorus/Reverb out to the two sides of a stereo PA. Nice. The chorus is less versatile. Basically it can be on or off. With no depth or rate controls, this sound can become monotonous (no matter how beautiful it sounds at first). The only real answer is to use an external chorus if you want any level of control – but then that's not really what you bought the amp for. The simple addition of one control for the depth of the chorus would rectify this easily. The chorus sound itself is very rich, a Roland trademark really, and can't be faulted, and of course it records very well indeed. The level of shift is unobtrusive, and used in conjunction with the Reverb control gives a powerful rhythm sound that is a real alternative to using a soft distortion or sustain to fill it up to the required level.

The real boon of the Cube Chorus 60 is the number of sounds that can be created using the various systems that can be patched in the backpanel. In the studio, the sounds that the Chorus makes can be taken from the cab itself, the pre out, or, if you like playing around a bit, try putting the extension speaker out into a 15" bass cabinet – like a certain vodka, the effect is shattering.

The different external amplifier sounds are thoroughly explained in the owner's information sheet, and basically, they mean that the external amplifier will be available to play the chorus and reverb sounds, while the acoustic sounds from the cabinet are clean.

To niggle again, the addition of an Overdrive Out, or even a three-way switchable Reverb/Chorus/Overdrive out (with an overdrive on/off) would be a great boon, allowing the same versatility on the overdrive that is available on the other two effects.

Gripes apart, both in performance, and in the studio, the Roland Cube Chorus 60 is amazing. It has the power to cut through the stage sound adequately, while giving signals of sufficient quality for studio work. If you are going to buy just one amp for your studio, or if you currently use a number of effects and/or different amplifiers to get various sounds, try this one alone – it could save you a lot of money.

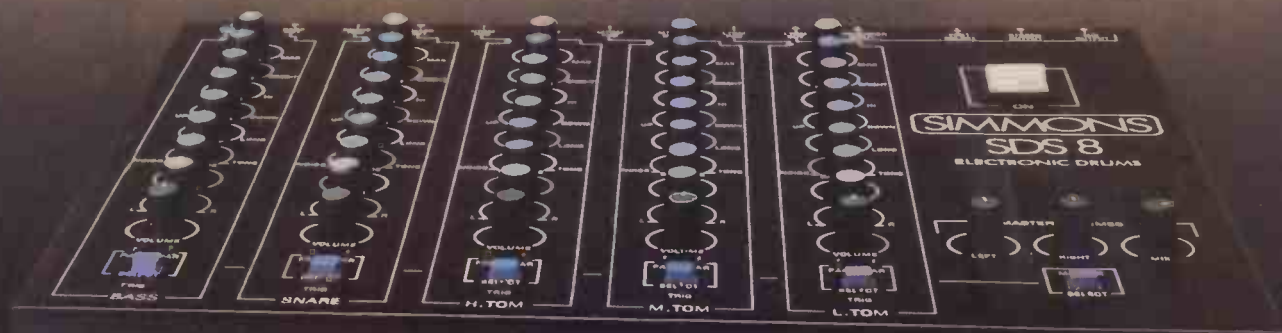
To conclude, we tested the amp with a Gibson SG, a Yamaha 2000 and a cheap strat-type copy, in all cases, the sounds from the unit eclipsed the constraints of the instruments themselves, and opened up a wealth of new sounds. Basically, you are not only playing the instrument, you're playing the amp too.

Tim Oakes

E&MM

The Roland Chorus Cube 60 is available now in most Roland stockists in the UK with a price of £285 inc. Information is from Roland U.K., 979 Great West Road, Brentford, Middlesex.

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WASHBURN

GUITAR REVIEW



BANTAM BASS

This is the latest contender in the headless bass stakes, and while it may seem as if another copy has been born, there are features and a level of manufacture to the Washburn Bantam that makes a mockery of the 'copy' tag.

For a start, the body and neck of the Bantam are based on wood. This is then encased in a massive shell of polyester plastic to give a fine matt finish that looks just like the carbon fibre of the Steinbergers – except that this guitar is, subjectively at least 'warm'.

A description of the controls on the Bantam would be meaningless – the basic Steinberger ideas were so damn good that there was no need to change them, full marks Washburn for realising that. The neck of the Bantam is apparently slightly thinner than the Stein, but this seems to aid playing high up the neck. The frets themselves are wide – and surprisingly low to the fretboard, but there was no attendant buzzing, except if you attempted to take the string action down to wood level – which is almost possible here.

So, it looks like a Steinberger, it hasn't got a head, and it is going to be mistaken for a Stein all over the place.

But, the Bantam does differ in some rather nice areas – like your pocket. British distributors Gavin Mortimer expects the Bantam to retail for around the £575 (or less) making it roughly half the price of a real one.

The second area of difference is around the sound. The tight treble on the Bantam is sharp and clear, with none of the 'clank' that is often associated with high powered treble boosted bass. This is a real boon for slappers, and it springs to mind that the bass might have been designed principally with them in mind – (thumb followed by finger – 'ban' 'tam' – Geddit?) – and it certainly packs a punch. The controls are very easy to reach, either in a horizontal position, or at a near vertical angle (that seems to be the trend now) – hence the controls in a single line rather than curved. The flatness of the pickups, and the string height from the body of the Bantam certainly aids slapping, and with the action up a trifle, it feels like a well set up Precision. Unlike its more pedantic rivals, the Bantam is lighter, more manageable, and (once you have mastered the headlessness – and your hand stops zooming off the end of the neck) it is very fast indeed.

On 'normal' bass playing (ie. non-slapped) the Bantam went to demi god status. The

rich bass sound, that is rounded without becoming saccharine sweet, is a new dimension to bass playing – mainly through the versatility of the sound itself. Between the sharp treble and the hyper mellow bass sounds, there is a guttural growl that is ideal for hard rock, a warm and powerful drone that would admirably suit 'prog' rock or even soul, and a (very) forceful sound (on a single setting) that ranges from a muddy deep bass to a thin sqawk at the top that allows the Bantam to sing right over synths and electronic keyboards.

Technically – the bridge section (standard single piece bridge/tuners/tailpiece) is a nice rest from the usual blocks of tin that masquerade as such these days. The pickups are Washburns' own, and excellent they are too. While their lineage might be traced to a number of similar models, the output is very high indeed – and intelligent use is required until you get used to the extremes that this instrument is capable of.

The polyester finish is very hard, and offers a high degree of protection to the instrument (Gavin actually dropped the sample – with the total damage being an almost invisible 'dent' on one edge). At the top of the neck are a pair of string clamps, one to each pair of strings, that hold them in position. Washburn are planning to make this four separate ones – which preempts my initial gripe about this. The clamps allow the use of single ball ended strings instead of the specialist designs that are required by the Steinberger – a great advance.

The Bantam comes complete with a plastic carrying bag, with carrying straps as well as a shoulder strap. (The only problem being that you might get taken for a terrorist – it looks very like a rifle slung casually over the shoulder . . .).

To conclude then, it is perhaps unfair to compare this instrument with its predecessor – taking the price into consideration the two should be in different markets. That they are not is a tribute to this instrument, that offers the latest technology for bass players at a price that the majority can afford.

Washburn are planning to add some new colours to the range in the near future – including a metallic silver, yellow, and red.

Hopefully, they will now turn their attention to the guitar side of things and add that string to their bow. I hope so.

Tim Oakes

E&MM

Information from Washburn, 20 Victoria Road, High Barnet, Herts.



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Crisis? What Crisis?



Crisis? What Crisis?

Of all the many duos that currently inhabit the popular end of electronic music, none have inspired the imagination or varied their output as much as China Crisis. Originally simply the union of two schoolfriends, Garry Daly and Eddie Lundon, the line-up has recently been augmented by oboe and sax player Steve Levy (known as 'Snowy') and drummer Gary O'Toole.

CC's first album, *Difficult Shapes And Passive Rhythms - Some People Think It's Fun To Entertain*, was released to considerable critical acclaim in November 1982, and a single from it, 'Christian' provided the band with their first taste of chart success. Since then there's been no looking back. The early part of 1983 was taken up with China Crisis' first major tour supporting Simple Minds, and only six months later, a second, more mature album product, *Working With Fire And Steel - Possible Pop Songs Volume Two*, was released to tie-in with the appearance of the single of the same name.

Dan Goldstein disrupted a Christmas drinking session and managed to get a word in edgeways.

How and when did China Crisis start?

Eddie: It started when Garry and I were still at school in about 1976. We used to play anything: Garry used to play a lot of bass then, and I played guitar. The first synthesiser we got was a Yamaha CS10. At the time I was going through a phase of liking Yamaha gear a lot because I had a Yamaha guitar, too - an SG2000. I had it for ages but unfortunately it was stolen recently, though I was lucky enough to get another one that's almost identical.

I don't really know why we chose the CS10. I think it was just the fact that there was nothing else available that could make those sounds. For instance, Korg stuff nowadays is great but in those days, and at our sort of price-level, they were awful.

A little bit later on, a friend of ours bought a Boss Dr Rhythm, and that was the first time we had access to a drum-machine. At that time the more elaborate machines were just too expensive for us, so we just used to use the Boss in obscure ways, making a lot of use of the rim-shot, which we liked a lot...

So much for then; how about your equipment now?

Garry: After we bought the CS10, we started borrowing a lot of instruments off people we knew, and we didn't buy anything else until we got a Cat mono-synth. After that we had a Roland SH2 and then, when we signed to Virgin, we got our first polysynth, a Korg Polysix. The main reason we chose that was simply the fact that it made the best sounds, plus the fact that it seemed relatively cheap at the time.

More recently we've got a Jupiter 8, which we use a lot, and we're expecting an Oberheim OB8 any day now. I like the spilt-keyboard facility on the JP8, and also the way you can de-tune the oscillators apart to give things more depth. I don't know all that much about the way the keyboard works as a machine, and in a sense I don't want to know because I'd rather just judge things on the way they sound. I like keyboards that are neatly styled and logically laid-out, because that way you can come to them for the first time and get them to work straight away, rather than having to spend a lot of time finding out what's going on inside.

For effects I tend to use a Roland SDE-2000 or a Space Echo, and they're connected to the Jupiter 8 almost all the time because without a bit of echo it can sound a bit dry.

Snowy: During the sessions for the last album, Mike Howlett, the producer, introduced us to the Emulator, and we liked it a lot. If we had enough money we'd probably buy one! We created our own effects rather than using the factory disks. One of the things we did was sample a guitar to make it sound like a pizzicato violin, putting the microphone right over the bridge of the

guitar. The sound was incredibly life-like, probably better than it would have been if we'd actually sampled a violin! We also used it for vocal sounds, but on balance you've got to admit it is very expensive. There's no way we can justify spending upwards of five grand on a keyboard; in fact we aren't even going to hire an Emulator for live work, because although it would be a very useful effect to have on stage, it just doesn't make economic sense to us at the moment.

Eddie: Unlike a lot of guitarists I don't feel the need to have lots of different guitars for different sorts of songs. I've just got the SG2000 which I'm basically very happy with. I've also got a Roland guitar synth which I used on the first album and the last tour, but I don't use it much now. The sound is just a bit too thin: it doesn't make the guitar stand out enough amongst all the synths. To vary the sounds a bit I use a Roland 555 Chorus Echo and an SDE-2000.

I've not really had much of a chance to use the Fairlight, but it's definitely something I'd like to look into in the future, because it seems to have almost endless possibilities. On the other hand, I wouldn't really like us to get too dependent on computers, because in many ways we're trying to get back to basics now, to get back to a more traditional band format. If you start using computers exclusively you get too inward-looking, too self-indulgent.

How did you get your first break into recording?

Eddie: We recorded a version of 'African and White' as an independent single that never came out. We did a demo of it on a Portastudio that we'd borrowed from a friend (again), and I remember we also used a DOD Analogue Delay for echo and so on. There was a 24-track studio really near to us in Liverpool that had its own

record label, Inevitable Records. The people there really liked the demo and offered us some studio time instead of a cash advance. We re-recorded 'African and White' there with Jerry Lewis of Inevitable producing. That was the first time we'd ever been in a recording studio, and of course it was great fun, messing about with all that flashy equipment.

Recording was the first thing we did because in those days we weren't very interested in playing live. We managed to get hold of an old Akai 4000 reel-to-reel, which we actually had for ages simply because it was the only thing we could afford. We had very little in the way of effects, just a Wem Copicat that we used on guitar and keyboards.

I remember we put real drums on the 24-track version of 'African and White', played by a guy called Dave Reilly, who also played on some of the first album. The thing was that we'd already been using drum-machines for perhaps two to three years, and because we'd never had the money to buy a Linn or anything like that, we'd just got bored with what we were using. There was a time when I thought drum-machines could replace drummers totally, because in theory they can do everything drummers can do, but after a while you realise that they can't create feel, though it's also true that a lot of drummers can't do that either.

First Album

The first album was recorded very sketchily, because half of it was recorded before we signed the licensing deal with Virgin, when we were still doing a lot of demos. So half the album was recorded in a little eight-track in Liverpool, with just Garry and I producing. That eventually made up one complete side of *Difficult Shapes And Passive Rhythms*. The other side was produced by all sorts of different people, because it was recorded in lots of little bits over a long period of time. Jerry Lewis did 'African and White', Pete Walsh produced three tracks, and Steve Levine did two tracks.

We learnt a lot from that album. We learnt that we really needed to have one producer all the way along, for a start. Also we decided to get in Gary and Snowy for the second album after we'd toured with them, because that way there'd be no need for Garry and I to struggle to do all the instrumental parts ourselves, overdubbing and so on. There's nothing on the first album that I'm actually unhappy with, because I still think it's a great album, but the second one is definitely superior...

What benefits have the additional members brought with them?

Eddie: Playing in the context of a band, you tend to change things automatically rather than consciously deciding to improvise. In a band you can bounce ideas off other people and draw on their feel, but there's no way you can bounce ideas off a tape-machine.

For the Simple Minds tour we only had about five days' rehearsal with the band. What we did with the new members was just give them a copy of the first album and say 'go and learn it'. Having such a short time in which to rehearse was good in a way because it meant there was quite a lot of spontaneity in the way we played each night of the tour, especially during the first few.

Garry: The Simple Minds tour was really the first time we'd played live without backing-tapes. Before then we'd used tapes for drum-machine patterns and bass lines. The reason we used tapes in the first place was that when we started off, we never used to gig at all, so all our songs were written at home and recorded onto tape. It seemed a natural extension of that process to use tapes live as well, but when we played as a band without tapes we definitely enjoyed playing more, so it was a transition that was worth making. If you use tapes for too long you become dependent on them; they tie you down completely and they stop you from introducing any type of feel. They can't buy you a drink either!

Eddie: I think writing as a group is a very good way of working, though there's nothing essentially wrong with working as a duo. It would have been possible for Garry and I to carry on that way forever if we'd wanted to, because a song's a song and it doesn't really matter how many of you there are involved with it. But I do think that playing as a group is much more satisfying than anything else we've done.

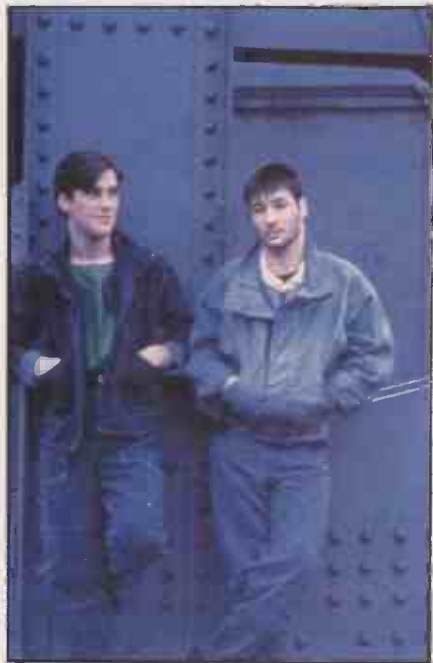
Writing Schedule

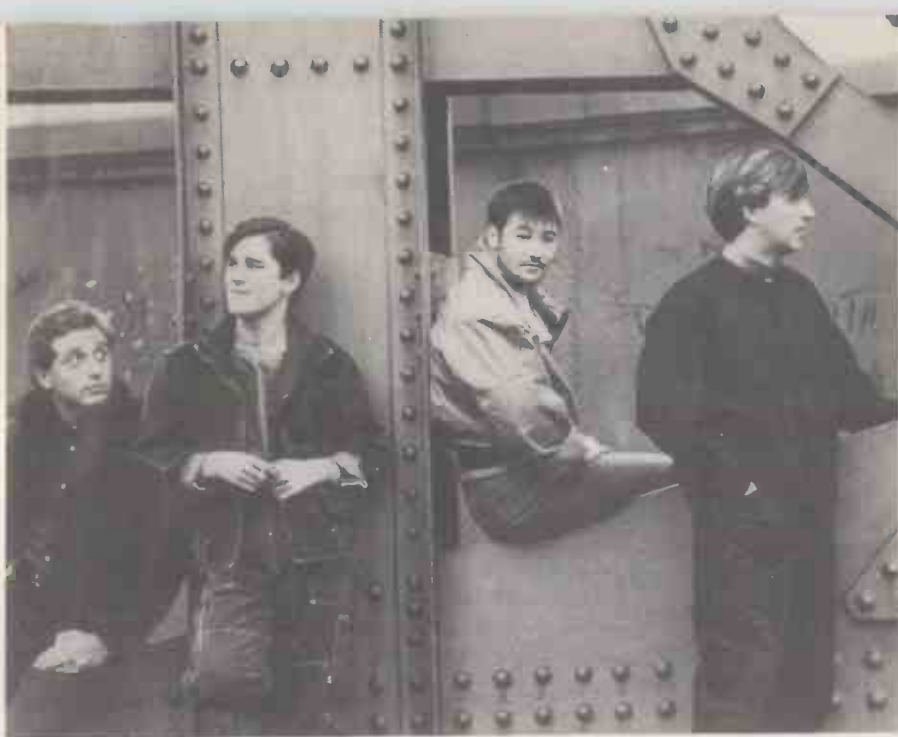
We've now begun to work to a kind of schedule. We're setting aside time to write songs, time to record, time to rehearse, and time to play gigs. The only problem is that whereas we know that, say, recording is only going to take up a small part of the year, it's possible for us to write things at any time, so that if any good ideas come up while we're touring, for example, it's really a case of just trying to remember them before we go back into the studio.

We used to write continuously, almost every day, but nowadays that sort of schedule is impossible because we're so busy. There are so many other things to do. Before we start writing songs as such, we usually do a week of just ambient stuff, just to relax us.

How important is the atmospheric side of your work?

Eddie: Well, in the early days all our pieces were instrumentals: just atmospheres and things we were putting down on tape almost as soon as we'd written them. We still do that sort of thing now, because we like both the pop aspect of music and the atmospheric aspect. Garry does a lot of writing for the ambient stuff, mostly because he composes from the keyboard and most of our atmospheric material is keyboard-based.





Working on those sorts of tracks enables you to relax much more. There's less worry when you're writing and recording. You don't have to worry about reproducing clichés the way you do with pop songs; you can get more involved with the music itself.

In a sense all our music starts off as instrumental because we always do the lyrics and vocals last of all. We've always liked to put that sort of material out as B-sides to singles, though obviously you can't do much more with them because of commercial considerations.

TV Airplay

One thing that did happen was that two of our early instrumentals got played as part of a television programme. Nobody had told us anything about it. We were sitting in Garry's living-room watching TV, and suddenly I thought to myself: 'Hey! That music sounds familiar.'

It was great, seeing what was really another side to our music – seeing it through the eyes of a television director. It was something that didn't require any effort on our part, unlike, say, *Top Of The Pops*. It was just there, and it felt good knowing that whoever had produced the programme had decided to use our music as opposed to anyone else's.

The only problem is that you can't really play ambient music live. Of course it can create atmosphere just as well as any other form of music, but as far as I'm concerned it's the wrong atmosphere, because when I go to a concert, I don't want to sit there gawping, I want to dance, feel some excitement.

I suppose eventually we might end up doing a whole album of ambient stuff; just a collection of various bits and pieces all together in one package, instead of putting it all out as B-sides to singles.

What sort of things have influenced your atmospheric material, and your music as a whole?

Eddie: The first atmospheric thing we heard was side two of David Bowie's *Low*, plus just after that, there was Eno's *Before And After Science*, which also had a big effect on us.

Garry: I like almost all of the *Obscure* series. People like Gavin Bryars, Michael Nyman, Harold Budd. In fact, we took the title *Possible Pop Songs* from *Possible Musics*, which is the subtitle to Jon Hassel's first collaboration with Brian Eno.

As far as the poppier stuff goes, it's difficult to say exactly what has much of an effect, because the mere fact that I like something doesn't necessarily mean that it'll influence what I'm writing. I suppose I'm influenced a lot by beats and rhythms: drum-machine patterns in disco records and so on. I know none of our stuff really sounds much like disco material, but we still pick up on the way certain sorts of rhythm are used.

It seems to me that quite a lot of China Crisis material has almost a classical structure to it. Have any of you received any formal classical training?

Garry: I haven't had any formal training at all, and certainly not on piano. Popular music allows you to create sounds without any particular virtuoso skill, which is one of the things I like about it. It makes no difference whether you've had four years studying music theory at Manchester University or whether you've never played keyboards before in your life. The only thing that matters is that you can create an interesting sound.

Snowy: I went through the usual classical training in brass and woodwind. It's a different situation for me because I play a much more passive role within the band, at least for the

time being. If Garry and Eddie say 'play this' I have to be able to learn it off very quickly. I've only recently joined the band as a full-time member, so I've only really just started writing songs and making a positive contribution in that way. What I'm doing now is a very big transition from the classical recitals and so on I was doing before...

Eddie: The thing about Snowy is that he's a very quick learner, and what's more he doesn't complain about being things not being technically right. We've worked with other classically-trained musicians in the past who've taken one look at what we'd asked them to do and said, 'you can't do that. It's all in the wrong bar. It goes against all the rules.' But Snowy isn't bothered at all.

How did your approach to the new album differ from the last?

Eddie: The big difference between this one and the last is that we recorded this one as an album as opposed to doing it in lots of different bits. We used two studios: Amazon in Liverpool for the backing-tracks and The Manor for overdubs and mixing. I definitely preferred working that way, because working over a short space of time gives you more of a chance to get involved with what you're doing. If you record things bit by bit, you end up having to listen to tracks that you recorded months ago, which can be distracting because you start listening more to the way you've progressed since then rather than to the songs themselves.

Natural Echo

As far as recording equipment goes, this album was the first time we'd used the AMS digital delay. Echo really is the most important effect because it's such a natural sound: it's something that's all around you. You can't ignore it. You can also do lots of interesting things echoing different instruments in drum-machine patterns...

Snowy: It is possible to go overboard on that, though. It's good to record some things completely dry. We always have our bass and acoustic drums fairly dry. You can never get away with using too much echo, because if you do that everything ends up in a great big acoustic wash. We put quite a bit of artificial echo on sax, for example, but for oboe we tend to just use the natural acoustics of the room.

Finally, do you have any ambitions that have yet to be fulfilled?

Eddie: Well, in the early days we never really wanted a lot of success. I suppose it's one of those things. You never really want it until you've got it, and once you've got it, it's not enough.

Initially the only ambition we had was to get some sort of record out, and it was only after we'd achieved that that we began to want more success. Now our only ambition is to get an audience who'll stick by us no matter what we do, rather than just like our music for a short while and then forget us.

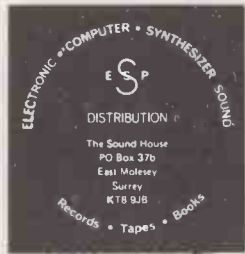
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"Hibi" Erik D. Huber (11. USA)
"The Lost Valley" <p>CLASS B</p> <ol style="list-style-type: none"> Perry R. Cook (26. USA)
"Ethnos 1: British Isles Section" 小野 文久 (28. 東京)
"Speed Way" Fumito Ono (28. Japan)
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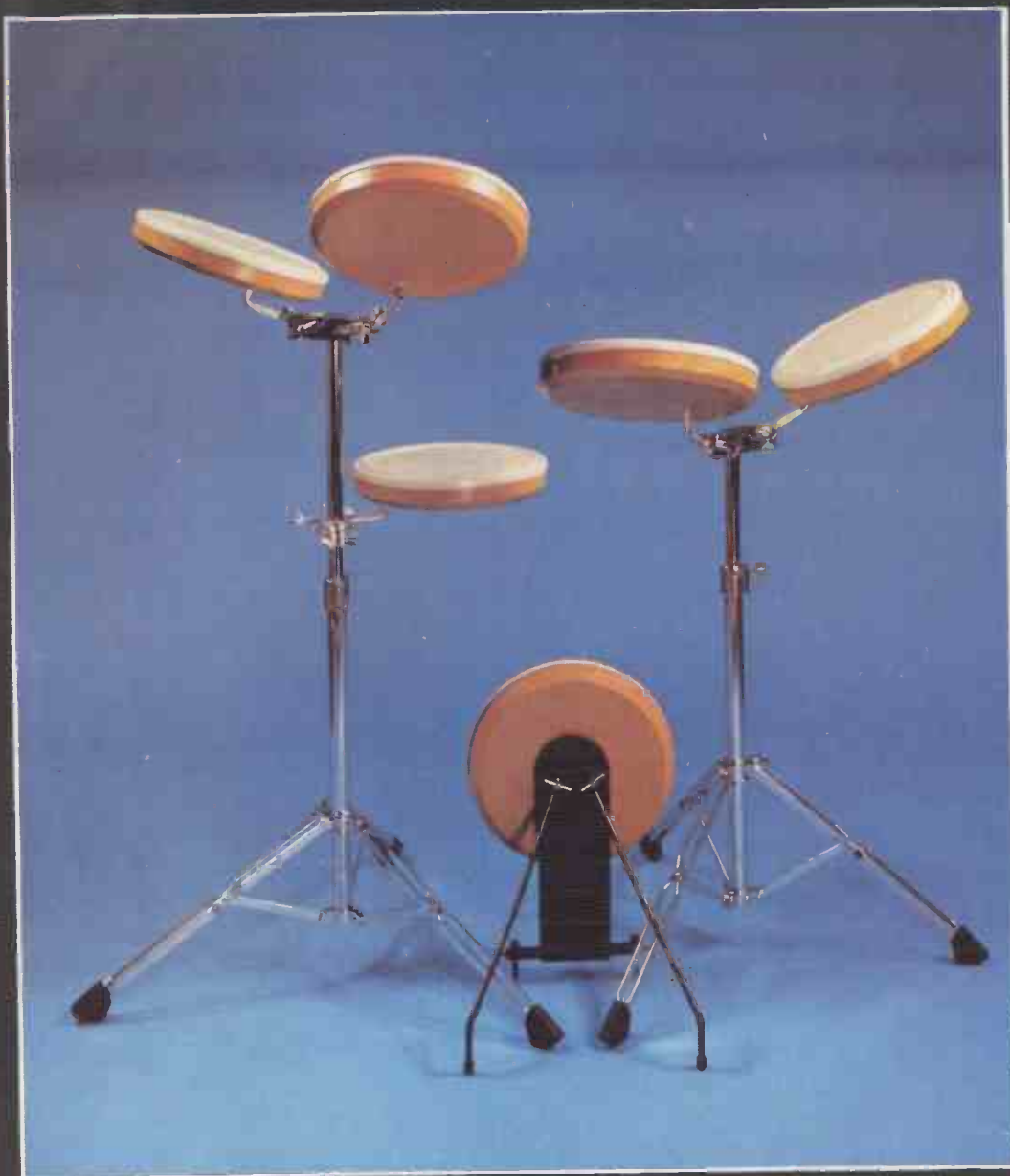
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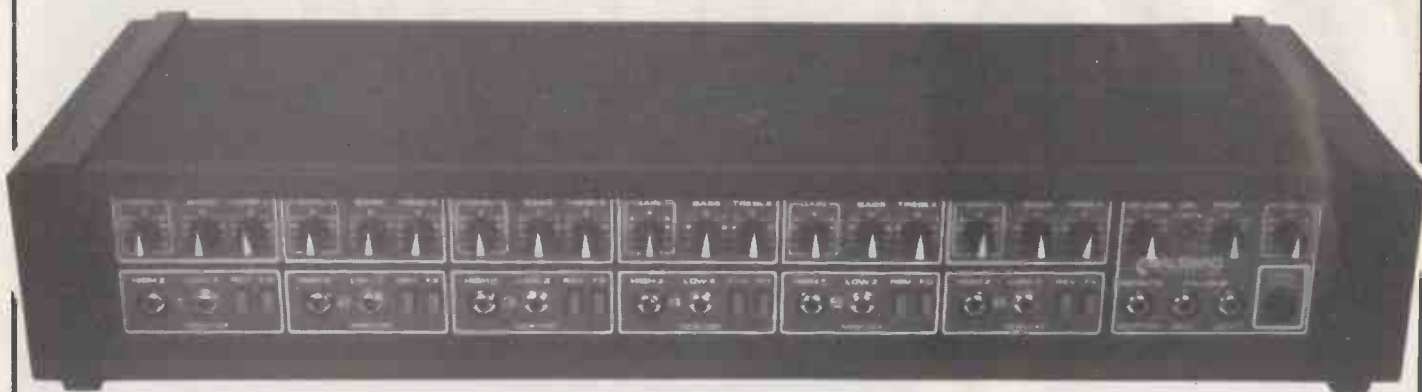
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Carlsbro Marlin 6-150 PA Amplifier



Carlsbro's new amp range includes the M150 and M300 power amps and the Marlin 6-300, bigger brother to the 6-150 reviewed here. It offers six independent input channels capable of accepting inputs from either high or low impedance mics, synth and guitars etc, and deliver the mixed result at 150 watts between two speaker outputs.

Controls

Each of the six channels accepts either unbalanced high-impedance or balanced/unbalanced low-impedance inputs, and each has individual gain, treble and bass controls. Two on/off switches for reverb and external effects are situated beside the low-impedance jack.

The main control panel to the right of the unit contains the master volume control and pots governing the amount of reverb, presence and external effects. A 5-pin DIN socket allows for recording onto or playing from a tape recorder or similar equipment.

A dual-spring Accutronics reverb unit is incorporated in the Marlin's design. The combined signal of the channels with reverb selected is fed to this unit, and the overall level of reverb effect is controlled from the main panel. Reverb can be switched on and off by a footswitch connected to the jack which is also on the main panel.

Presence effect can only be applied to the whole mixed signal. This brightens the sound by boosting mid frequencies and is a very handy feature to add character to flat-response microphones and help relieve dead room acoustics.

'FX loop' takes a signal from the pre-amp, through the send jack to an external treatment such as an echo unit, and the signal is then returned to main-amp stage via the return jack. The same channel can be treated by both 'FX loop' and reverb by depressing both

switches of that particular channel's input.

Output

Output is via two quarter-inch jack plugs at the rear of the unit. Each of these plugs carries the same mixed signal. Overall power is 150 watts into 4 ohms. Therefore the optimum performance will be achieved with two 8 ohm 150 watt speakers, although 100 watt speakers or even lower would be adequate depending on quality. Even though the signal to each of the outputs is the same, it is advisable that two speakers be used to avoid overloading. However, if one speaker is to be used it should be remembered that as impedance increases, power decreases. With a single 8 ohm speaker the maximum power would be 105 watts, and ideally a 150 watt speaker should be used.

In use, crosstalk between the channels is quite noticeable, particularly with low impedance inputs. To help keep this and general noise to a minimum, output level should be selected by the master volume control, and the six individual gain controls kept relatively low and used simply for obtaining the correct balance of instruments. For this purpose it would be handy to have some visual indication of the peak levels of each channel but, alas, this isn't available on the Marlin.

Construction

So far, so good. We have a good powerful amp with six independent input channels and two outputs at a price that makes you look twice at the date of the price-list. What else could you possibly want? Well, considering the market that this type of product is designed for would be an amateur/semi-pro band, gigging around as much as possible in an old beaten up Bedford, a good sturdy construction with a strong outer casing is indispensable. Unfortunately, the Marlin is held

together by eight screws (four at each end); when these screws are removed the unit simply falls apart (well, at least it's practical for the repairer!)

The Marlin measures 675 x 265 x 110mm, and the top and bottom of the casing are made from single sheets of 1/2" plywood covered in a vinyl material, without even a support at the mid-point.

However, the internal design of the unit is good. The front panel connections are well laid-out and finished off. Amp stages are segregated from mixing and effects circuits, keeping hum and noise down as far as possible. The amp circuitry is also good and output is protected against short circuit, mismatch, open circuit, reactive load and high-frequency burn-out.

Ease of operation and appearance are excellent. The knobs used on the front panel pots have a large white arrow head which gives a very clear indication of settings that can be seen from some distance; always helpful in a live situation.

Conclusion

With a system such as this you could carry on giving suggestions about what facilities it *ought* to have, but that is not the point. The Marlin sounds good under a variety of conditions, and is capable of taking considerable sonic abuse without complaint, even if its constructional integrity is a teeny bit suspect. Carlsbro have produced a piece of equipment which allows a band to get up and going on the road, with a mixing facility and a good amp all in one at an extremely reasonable price, and deserve to do well with it.

Glenn L. Hughes

E&MM

The Marlin 6-150 carries a recommended retail price of £295 inc. VAT, and further information is available from Carlsbro (Sales) Ltd., Cross Drive, Low Moor Industrial Estate, Kirkby-in-Ashfield, Nottinghamshire NG17 7LD. Tel: (0623) 753902.

Yamaha PS-55 Keyboard



Few companies have done as much to further the cause of the personal keyboard as Yamaha. Their unique experience in both domestic and professional musical instrument fields has given them a built-in advantage over many rival manufacturers, in that they alone have found it possible to incorporate untried innovations without first have to research the necessary groundwork. It comes as no surprise therefore to find that Yamaha's personal keyboards often seem to be first in incorporating a certain facility or two, and the PS-55 is a prime example of this, as it includes within its catalogue of features a rhythm generator with digitally-sampled drum sounds and a sequencing/recording facility whose sophistication is unmatched in this price area.

By way of introduction, it should be mentioned that the 55 lies at the top of a range of four PS models, of which the other three are the 15, 25, and 35. A four-octave C-to-C keyboard provides the 55's starting-point, and while this may seem prohibitively small in the context of professional performance, for most possible home applications it works well enough.

Either side of the keyboard are the two built-in stereo speakers, these being rated at 5W maximum output (impedance six ohms) and having a diameter of 12cm. Underneath the left-hand speaker is the 'fill-in' press-tab, of which more later.

Control Panel

Above the keyboard lies the main control panel, which spans the entire width of the instrument and contains myriad numbers of push-switches, sliders, and LED indicators, as befits a top-of-the-range model.

Working from the right, the first major control section is that for the Yamaha's 'Solo' voices. There are sixteen of these monophonic sounds, selected by eight dual-function switches, and broadly speaking these range from the sublime (Chimes, Rock Guitar) to the almost entirely unusable (Trumpet, Saxophone). As is so often the case with Yamaha keyboards, it's possible to combine two or more of these voices simply by pressing the

appropriate buttons simultaneously, although it should be noted that all the sounds remain monophonic regardless.

Moving to the left, the Orchestra section is configured in much the same way as the Solo one, with the obvious exception that the voices are fully poly-



In addition to an on/off selector and an individual volume control, the solo section also has three effects sliders for Vibrato Depth, Sustain, and 'Celeste'. Several of the solo voices have vibrato built-in to them, and the Vibrato slider can be used either to increase the effect's presence on these sounds, or to add vibrato to those sounds no so-equipped. Like Vibrato Depth, the Sustain slider has five fixed positions, so that infinite variation of rate is not possible. However, this is of little consequence in practice because the settings provided give the user a sufficient range of adjustment. It's really the addition of Sustain that makes most of the Solo voices tolerable, though adding too much can result in some fairly gross distortion from the built-in speakers. 'Celeste' is a complete misnomer because while it might be expected to introduce some sort of percussive envelope to the preset sound, it in fact does nothing of the kind, producing instead a mild low-frequency boost to thicken up the voices. Or at least, that's what the user's manual *claims* it does. In reality, its effect – even with the slider at maximum – is almost imperceptible on most voices, and experimentation with another model proved there was nothing technically wrong with the review sample. Very mysterious.

phonic. Again, these voices vary enormously between the best (Marimba, Piano, Harpsichord) and the worst (String Ensemble, Music Box). You will gather from the foregoing that, while Yamaha's percussive voices (both mono and poly) are excellent, some of their sustained-note sounds require some fairly drastic surgery if the PS-55 presets are to achieve anything approaching consistency.

It should be mentioned that combinations of Solo and Orchestra are possible and in fact positively encouraged by the manual, and in a sense this encouragement is justified since it's in this mode that the PS-55 sounds at its most impressive, and where the gap between it and so many of its competitors begins to widen appreciably.

PCM Drums

The real clincher though is the 55's rhythm machine. This offers sixteen preset rhythms (with five different fill-in variations for each), and all of these make use of PCM sampled drum sounds. Of these, bass-drum, snare and the optional handclap are the most striking, toms in the main being a little indeterminate. Despite the lack of any opportunity for user-programming, some of the rhythms generated by the drum-machine can compare with any-

thing produced by purpose-built devices costing thousands. Generally speaking, it's the Disco and Rock rhythms that are the most effective.

Disappointingly, the Yamaha's auto-accompaniment features aren't quite up to the level of the rhythm machine, though to make up for this is the fact it's possible to record any pieces up to 800 notes in length using the instrument's Music Programmer.

First things first, though.

The first octave-and-a-half of the 55's keyboard forms the Auto Bass Chord section, and the facilities provided here include Single Finger Chords, a non-programmable Arpeggiator, and a Duet function which introduces a two- or three-note harmony to every note played on the right-hand (melody) section of the keyboard.

Memory System

The music programmer is a means of storing bass chords, Solo, and Orchestra lines, recording them one by one and layering them one on top of another in much the same way as you would overdub on a multitrack tape-machine. In a sense it's quite similar to the programmable memory system on the Casio CT-7000, though it's not quite as logical to use because the switches are not arranged in tape-recorder fashion as they are on the big Casio.

This isn't to say the music programmer is *difficult* to use - in fact, it's a piece of cake to select 'Off', 'Record', or 'Playback' for each of the three instrumental sections, and build

up an arrangement section by section. The unfortunate aspect of the programmer is that, as on so many other personal keyboards, it is synced up to the machine's rhythm generator, which makes designing the memory chips much easier and cheaper but does limit the system's creative applications.



Conclusion

Despite its several minor failings, I don't think it would be an exaggeration to say that the PS-55 is one of the best personal keyboards currently available. Its designers have not included playcard or bar-code playback systems at the expense of the basic tonal and percussion sounds, and I think their

decision is the right one. I only hope Yamaha continue to follow the paths opened-up by the PS-55.

Dan Goldstein

E&MM

The Yamaha PS-55 retails at £529 including VAT, and further details should be available from Yamaha Special Products, Mount Ave, Milton Keynes, Bucks, MK1 1JE. (Tel: 0908 71771).

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Eko EM12 Keyboard

As a sort of 'turbocharged' version of the Eko EM10 reviewed in E&MM November 1983, the EM12 has a number of additional features to justify its higher price-tag, although in most respects the two instruments are very similar.

The most immediate difference is that whereas the EM10 had a dark brown finish, its bigger brother is painted silver to give it a more 'professional' look (it works) though the construction material is the same moulded plastic. The EM12 also has an extra octave on its keyboard, giving it 61 notes instead of 49, though the advantages of this are to some extent offset by the Eko's inability to reproduce very low and very high notes without some degree of distortion.

Most significantly of all, however, the EM12 has a stereo output as opposed to the 10's mono one, with twin four-ohm loudspeakers mounted at either extremity of the control panel. These are driven by a built-in power-amplifier specified as having a maximum output of eight watts per channel. Alternatively, if this output level is not sufficient, the instrument can be connected to separate mono or stereo amplification via two 'aux out' sockets on the rear panel which disconnect the EM12's internal powering as soon as a jack-plug is inserted.

In normal operation, the keyboard's output remains single-channel, although the EM12's rhythm unit is automatically panned across a stereo sound-stage, the location of the various percussion sounds depending on the rhythm selected. This latter is a little disconcerting at first, and I do wish Eko had provided some sort of 'mono' switch so that the rhythm machine's antics could be tamed for those users unaccustomed to drum sounds appearing from all over the place.

'Stereo Symphonic'

As for the main preset voices themselves, these only provide a stereo signal when what the manufacturers term the 'stereo symphonic' facility is in use. This isn't quite as glamorous as it sounds, since all it consists of is a three-position selector switch to the left of the control panel labelled *Chorus*, *Tremelo*, and *Ensemble*.

All these are variations on the modulation theme, and all of them spread the signal over two channels as they operate. *Chorus* is a slow-modulation effect of not inconsiderable amplitude, so that it acts in much the same way as a powerful flanger, though additional noise is noticeable by its



absence. However, in practice the *Chorus* is of limited application since it renders the sustained-note voices (eg. Strings, Musette) rather synthetic. It works better on more percussive, shorter-delay sounds such as Piano and Vibes, giving them added depth and sparkle: switching out of *Chorus* mode with while playing either of these two results in the sound collapsing dramatically into a weak, one-dimensional monophonic blip.

The remaining two effects are rather less useful, *Tremelo* being a reasonable approximation of the rapid-modulation Leslie effect much beloved of home organists, and *Ensemble* a combination of the other two, though with a bias towards *Chorus* that results in the two effects being almost indistinguishable on some voices (notably Brass and Clarinet).

The stereo effects produced by all three types of modulation are not terribly well-preserved by the built-in speakers, primarily — I would guess — due to their difficult location. Connecting two separate combo amps as described above improves matters a great deal, but more rewarding still is listening through an accurate and efficient pair of stereo headphones via the socket provided on the rear panel. The EM12's output is really quite high, so unless you want to encourage an attack of premature deafness, it's advisable to set the overall

volume slider fairly low when listening in this manner.

All the remaining functions (auto-accompaniment, one-finger chords, programmable chord memory, etc.) are identical to those on the EM10, with the exception, of course, that the range of these facilities is extended by the provision of the extra octave.

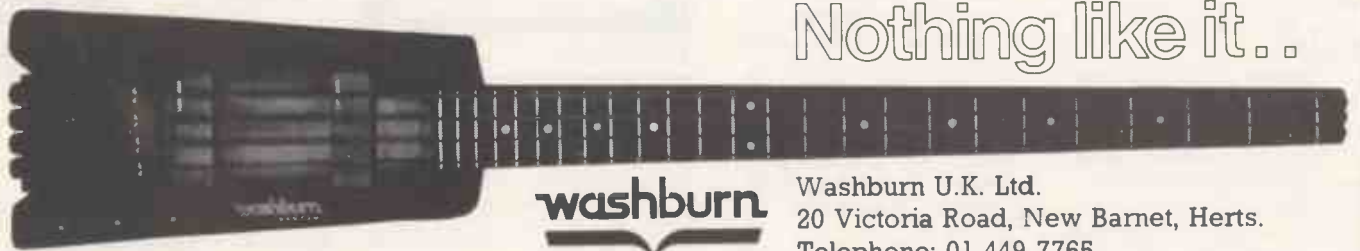
The potential usefulness of the stereo effects is not in question since its relative importance will inevitably depend on the types of uses envisaged for the EM12 by its buyer. What is in question however is whether or not the extra £100 charged for the 12 over the sum asked for its smaller brother could have been better spent. Certainly, from my own point of view, I would have liked to have seen a larger number of more versatile preset voices, several of which, as stated in the EM10 review, are simply octave variations of other sounds. Don't get me wrong, the EM12 is still an attractive instrument, but that can't stop me from feeling that its designers have missed some of the opportunities an extra few lira or so of development budget present. Perhaps we shall have to wait for the EM14.

Dan Goldstein

E&MM

The Eko EM12 carries an RRP of £399, and the importers, John Hornby Skewes Ltd., of Salem House, Garforth, Leeds should be able to provide additional information.

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Dr Böhm Digital Drums



The electronic musician of today, whether he knows it or not, is greatly indebted to the home organist, for it was he that popularised the drum machine in its infant days. Traditionally, the drum box was built into the organ and featured a fixed set of rhythms – bossa nova, tango etc. which bore little resemblance to their names, but did help the player keep strict time, musically speaking. It was only when Roland launched the 'Dr Rhythm' drum machine in 1979 that other musicians really began to take an interest, as this device was programmable and contained fairly realistic sounding drums.

Since then, the drum machine market has literally exploded with the introduction of more and more sophisticated devices containing 'sampled sounds' i.e. real drums recorded and stored digitally in memory chips that can be triggered whenever a beat is required.

Ironically, the home organist-type of drum machine has decreased in popularity, in this country at least, but on the Continent they are still big business, and it is one such device that we are reviewing here. Before some readers skip to the next pages, let me just say that the Dr. Böhm Digital Drums are worthy of your attention, for they have many attributes not yet available on any other machine and come in both ready-built and kit form, making them a unique proposition to anyone unable to afford the higher price of a Linn Drum, for example.

The Dr. Böhm also comes in many configurations but a complete unit with factory-set rhythms and fully programmable section costs around £900 ready-built and only £650 or so in kit form – very attractive I'm sure you'll agree.

The Unit

The ready-built Digital Drums, in free-standing form, comes in a strong ABS-type plastic case about the size of an average briefcase (19" W x 14" D x 6" H) with a retract-

able handle for ease of portability. The internal chassis is metal and the whole lid hinges for easy access to the circuitry during construction if this is being attempted.

Apart from the large instrument voice buttons and three rotary knobs, all other functions are controlled by momentary pushbuttons with built-in LED, for instant status indication, located neatly in two rows on the front panel.

The top row select the preset rhythms of which there are 180, accessed by 18 rhythm buttons and a group of Variation buttons. These are all generally usable as they are and range from 'Pop', 'Disco' and 'Reggae' to 'Jive', 'Samba' and 'Beguine' (great for Julio Ingleslas impersonations). The second row controls allow access to every parameter necessary for programming your own rhythms, as well as the selection of automatic insertions of fills, drum breaks and solos which alter, depending upon the preset rhythm chosen, so as not to interrupt the transition from one rhythm to another.

Features

The basic Digital Drums unit has 24 rhythm instruments stored digitally in only two chips with a total storage capacity of 256K of memory. Each instrument has its own selector button which is used to enter that instrument into a rhythm pattern. Several instruments such as the bass drum, toms and snare have two preset volume levels. These allow accented beats to be programmed by selecting the louder instrument for that rhythm, and are enabled by depressing one of two 'Shift' buttons, rather like changing from upper to lower case letters on a typewriter. In addition to this, all instrument volumes can be re-programmed in 9 volume stages and then stored. This is a good facility for introducing dynamics into your rhythms, and there is a master volume control for overall adjustment of the instru-

ments once their levels have been individually set.

In total, there are 44 instruments available which is almost double the amount offered on any other digital drum machine. The standard of the sampled sounds is excellent; they are very authentic and have no abrupt cut-offs (which the MXR unit suffers from, for instance). My personal favourite is the snare drum roll which is unique; no other drum machine has this feature. The full complement of instruments is as follows:

2x Bassdrum	2x Hi-Hat closed
3x Snare	2x Hi-Hat stuck closed
2x Rimshot	2x Hi-Hat open
Snare Roll	2x Ride Cymbal
3x Tom 1	2x Crash Cymbal
3x Tom 2	2x Tambourine
3x Tom 3	2x Maracas
3x Tom 4	High Bongo
Low Bongo	Claves
Wood Block	Cowbell
Conga 1	Handclap
Conga 2	

Continuing with the features, each of the 180 preset rhythms has an associated fill-in, and drum break which can also be programmed as either rhythm 'introductions' or 'endings', rather like Roland's TR808. The fill-ins can be manually selected by push-button, or automatically at random or after every 4 or 8 bars. This gives a variety to the preset rhythms which are programmable over two bars with a total of 32 beats. Additional variations can be implemented using the two 'Solo' buttons, which select short drum patterns of two or four bar lengths. There are 36 solos available but some are only slight variations on the others. However, they do add another dimension to a continual rhythm and are worth using.

The tempo of the preset rhythms can be adjusted from its normal setting by +/- 30 beats per minute. Alternatively, the tempo can be re-programmed anywhere from 35 to 280 bpm, using the digital readout and



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Unlike other devices, the Dr. Böhm has a permanently operational randomising facility which gives an animated feel to a rhythm, imitating the instrument stroke-length variations that a human drummer inadvertently creates.

Using the presets a song or 'sequence' of up to 500 bars can be programmed including drum breaks, fill-ins, solos and tempo changes. These sequences can be run in continuous form or stepped, with a digital readout of the bar number being played to tell you just where you are.

Programming

As well as preset rhythms, the Dr. Böhm offers 36 self-programmable rhythms each with its own fill-in, drum break and 2 or 4 bar solos, which can be stored under the names of the 18 preset rhythms. You select the programmed rhythm using the 'Free Pattern' pushbutton and the required rhythm momentary button. If 'Free Pattern' is not pressed you'll call up whatever preset is stored in that location, instead of the user-



Rear panel features.



Programmer and Instrument controls.

created rhythm.

Rhythms composed by the user can be up to 32 bars in length with a maximum of 64 beats per bar. A metronome (using the 'clave' sound) can be activated as an aid whilst programming. The required time signature of a rhythm is chosen, using the 'Time' pushbutton, from the available list: 2/4, 3/4, 4/4, 6/8, 12/8, 5/4 and 7/4. Then you simply 'play' the instruments in real-time and they are remembered.

The alternative to this is the 'static programming' method where the relative instrument is selected with the momentary pushbutton and memorised at the next beat by depression of the 'Step' button on the programmer section. Editing of any bar, rhythm or total sequence is possible by transferring the data into the Edit Buffer and modifying things beat by beat. It is a straightforward operation using the 'Insert' and 'Delete' buttons to add extra bars to your rhythms or extra rhythms to your sequences, whatever takes your fancy. Rhythms and bars can also be copied when creating a sequence, obviating the need to re-programme the same bar twice whilst also saving on memory capacity.

Sequences, once created, are stored in a similar manner to the preset and programmable rhythms ie. using the same rhythm pushbuttons. Thus a maximum of 36 sequences are possible, which will automatically loop unless a 'stop' has been

requested. The 'stop' facilities are very good on the Dr. Böhm for you can use either the main Start/Stop button or the Auto Stop. The latter lets you stop your rhythms or sequences on the first beat of the next bar, to create a natural ending with a downbeat instead of an immediate halt.

Connections

With the Dr. Böhm, add-on kits are available to increase the connection facilities on the rear panel. The basic drum machine has a stereo output split Left and Right on jacks, but an 8 channel split output for individual instruments can be used as well, if the kit is bought or requested on your ready-built unit (price £9).

Space is available for the addition of 5 pin DIN sockets for a cassette interface and triggers, allowing sync-to-tape and tape dumping of the memory contents (price £51). Further add-ons allow headphone monitoring (£21) and an Automatic Accompaniment device for home organists.

Conclusions

The Dr. Böhm Digital Drums are impressive and yet bewildering (due to the number of pushbuttons with dual functions and the sheer amount of variations possible). The sounds themselves are as good as any around, and there should be enough

memory capacity for most users. The heart of the unit is the digital display which minimises the chances of getting things wrong, as it continually emits information that helps you to learn your way around the machine whilst also teaching the rudiments of rhythm composition, in a way.

This unit should appeal to a wider audience than, say, an Oberheim DX or a Drumulator, as neither of these provide pre-programmed rhythms. For a lot of people this is a problem, as they find it hard to create rhythms from scratch. With the Dr. Böhm you can use the pre-set rhythms as a starting point and then modify them, as well as composing full rhythms of your own.

Not to put too fine a point on it, I think this machine is a real winner. It is comparable in price to the Drumulator and Oberheim but with a wider range of instruments. In kit form it represents very good value for money, and anybody competent at fine soldering would be capable of constructing one in under 24 hours.

Ian Gilby

E&MM

A free-standing Digital Drums (including programming facilities) costs £963 inc. VAT and carriage (ready-built) or £669 (self-assembly kit). Further details (plus a demo single for £1.45) can be obtained from UK Agent: G. Watkins, Swankit Instruments, Chantry Park, Henfield, West Sussex BN5 9JE. Tel. (0273) 494 238.

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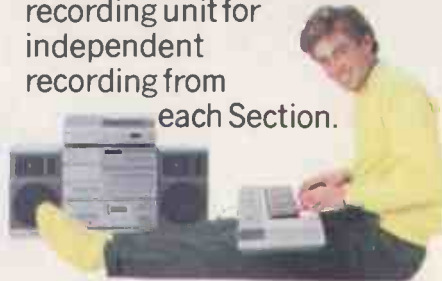
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Roland Drumatix Modifications

The Roland TR606 has proved to be one of the most popular drum machines. It is relatively inexpensive considering the features it offers, and is ideally suited to the electronic music-based musician.

Here is a simple and extremely cheap modification which can be made to the TR606 to provide individual instrument outputs like its big brother, the TR808. The two photographs give a visual indication of what is involved.

Procedure

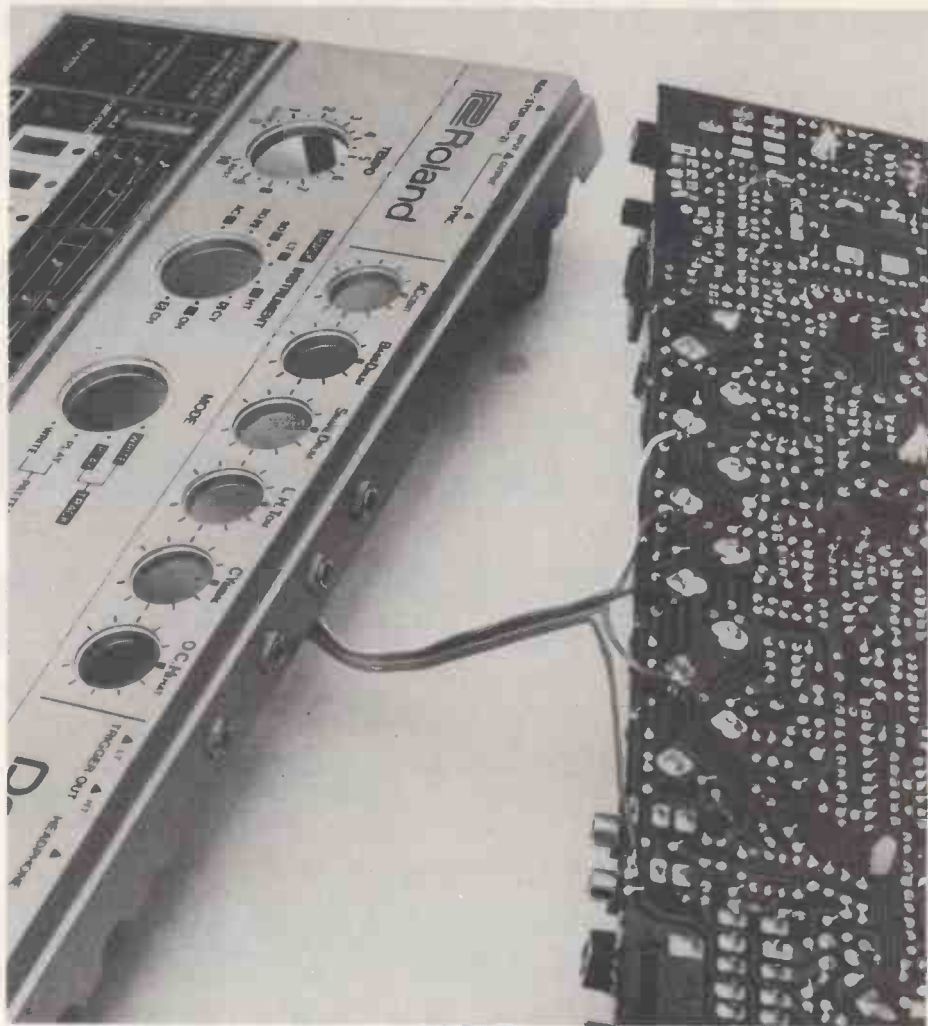
Having dismantled the unit to reveal the electronics, a connection is made, using a short length of ribbon cable soldered between each track of the level potentiometer that's mounted on the main PCB, to the tip connection of a 3.5mm jack socket. An earth connection is also made from the edge track of the PCB to a bus bar linking the jack sockets together (see Photo 2).

The sockets are all mounted in line with the relevant level control knobs on the rear of the upper plastic casing (Photo 1). It is necessary before re-assembling the case to remove the control knobs from their spindles, to allow the sockets space. These can then be glued in place after the case is assembled back together, using an epoxy or cyanocrylate adhesive.

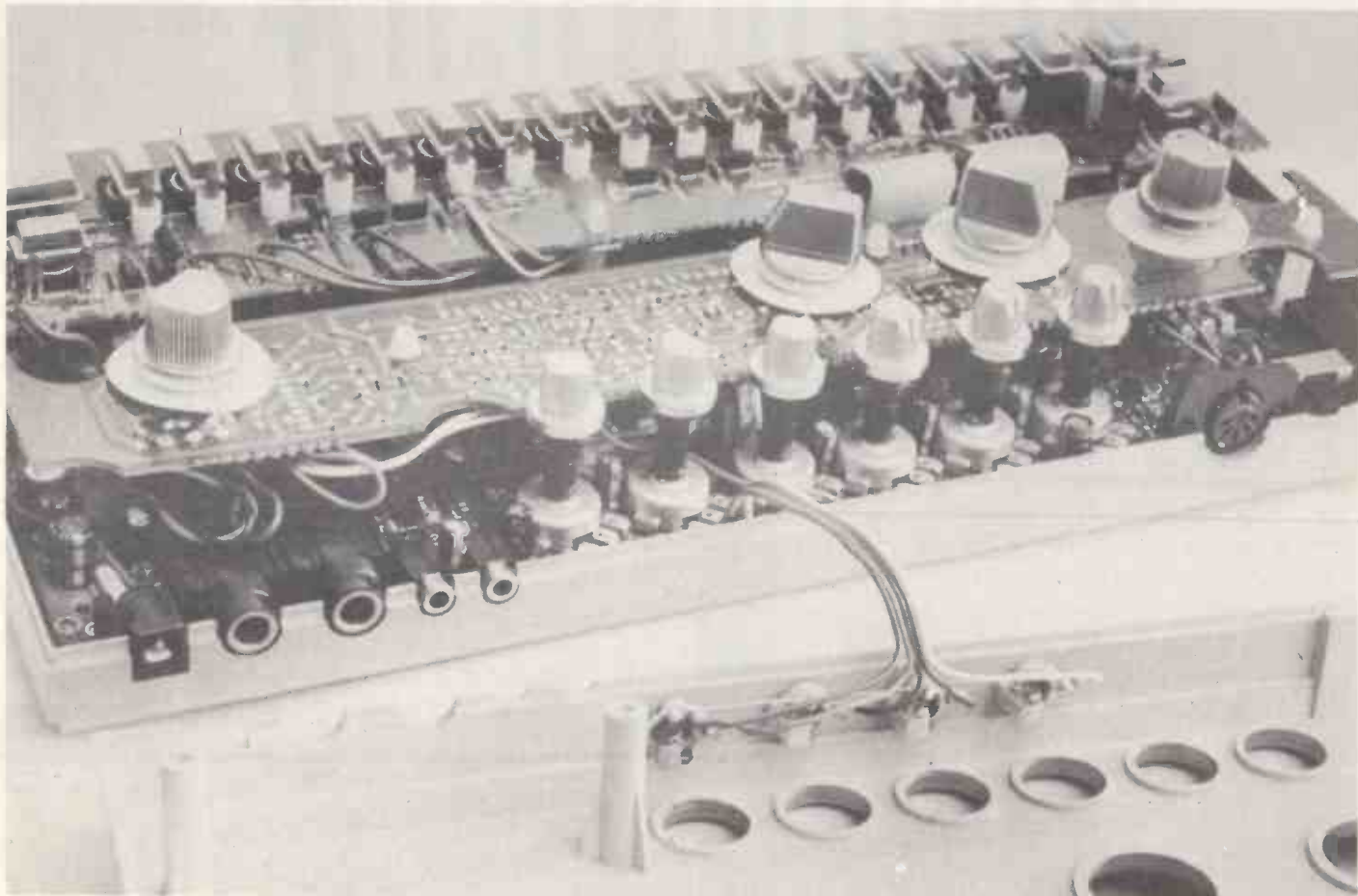
The instrument signals bypass the onboard level controls and main signal mixer, and are therefore controllable externally. Each one can then be processed by various effects such as phasers, compressors and echo units, and also placed in a stereo image via routing to a mixing desk. The TR606's Accent control retains control of the output signal, so rhythm emphasis may still be implemented.

Brian Jones

E&MM



Ribbon cable connections to underside of PCB.



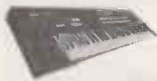
Internal layout showing ribbon cable and additional mini-jack sockets fitted.

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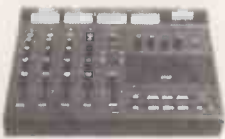
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Korg Poly 800 Synthesiser



Hard to believe though it may seem, it's actually less than a year since the PR people at Korg announced the Poly 61 synthesiser onto an unsuspecting public. It set a trend among poly-synths that has since been followed by Roland (the JX-3P), Yamaha (the DX series), and, more expensively, Rhodes (the Chroma and Polaris), in that it was the first such instrument to utilise digital setting of parameters to cut the number of mechanical controls down to a minimum in order to reduce parts costs and increase portability considerably. It was also Korg's first – and, from a sonic point of view, very successful – foray into the world of digitally controlled oscillators.

The Poly 800 continues along both these paths, and in the former case has taken the ultimate course in doing away with almost all mechanical controls save for three slider potentiometers, one rotary one, a score or so touch-switches, and a performance joystick. All these are located at the instrument's top lefthand corner, with the schematic of programmable

parameters printed on the right, as on the Poly 61. However, the Poly 800 is rather better endowed in this department than its senior stable-mate, in that almost every conceivable parameter known to synthesists can be fiddled with, including the built-in Chorus unit, Break



Point and Slope (in addition to ADSR) on each of the Digital Envelope Generators (of which more anon), and control over MIDI in/out.

Alterations

Altering preset values of parameters is accomplished in much

the same way as on the Poly 61, by pressing the 'Prog/Para' switch and changing values via the Down and Up switches just to the right. Storing settings in memory is accomplished with the red Write button, slightly further to the right.

In the oscillator department, the 800 goes one better than the 61 in offering two per note in the context of eight-note polyphony as opposed to six-note, making sixteen oscillators in toto. However, both DCOs offer a choice of only square or sawtooth waveforms and a choice of three octave ranges, and this in fact proves to be something of a limiting factor when it comes to the instrument's sonic versatility. For while the synth can quite willingly reproduce a myriad variations on the brass/organ/strings theme, radically different sounds are difficult to achieve, largely due to this lack of versatility at source.

Digital Envelope Generators

On the credit side, however, there are no fewer than three envel-

ope generators, one for each oscillator bank and one for the VCF and Noise. Not only do these facilitate control at six points along the envelope instead of the more usual four, but the fine degree of control available for each parameter (31 steps) results in easily the most versatile EG section the right side of £1000.

As well as the Chorus unit mentioned above (which is quite comfortably Korg's quietest circuit to date, incidentally, even though its variability is nil), the Poly 800 also boasts a digital fully polyphonic sequencer of 256-step storage capacity. This can only be programmed in step-time from the control-panel (I think it's safe to say that real-time programming would not have been feasible at this price level) and it is of course possible to clock the sequencer externally via the MIDI out.

Keyboard Performance

The keyboard itself is only four octaves in length, with a light but positive action that's typically Korg. Whereas on most instruments of this sort I would have expected a limitation such as this to be fairly serious (even the Poly 61 had five octaves), in practice there were few occasions when I wished for greater extension during perfor-

mance. The joystick control is quite a versatile one, seeing that it's capable of modulating pitch, DCO and VCF.

Factory Presets

The Poly 800 comes complete with factory sounds loaded into its fifty memories (these are also stored on a supplied cassette), but a lot of these are a bit disappointing and don't really make full use of the synthesiser's capabilities, while those sounds that are given names similar or identical to the factory settings on the Poly 61 are rarely as good as their forebears.

When it comes to programming your own sounds, the first problem that becomes apparent (once the waveform limitations have been negotiated) is the provision of only one filter for all oscillators. The

It's an effect that can be quite fun at first but it rapidly becomes fatiguing and eventually annoying. I realise that such an economy is probably necessary if the Poly 800 is to be the price breakthrough it's intended to be, but I still can't help thinking that the money spent on providing three envelope generators might have been better spent a little closer to the source of the sound-generation chain.



upshot of this is that no note can be triggered individually without any held notes being re-triggered also.

Still, these gripes can't detract from the fact that what the Korg sets out to do, it does well. The



Korg Poly 800 Synthesiser



system of programming is ridiculously easy to master regardless of whether or not you've had previous experience of synths with digital control, and if you take your time programming the parameters – particularly the VCF and Modulation Generator – the Korg will reward your labours with some fine, full-bodied poly sounds, equally effective whether you regard it principally as a lead or a backing instrument.

Construction And Finish

Undoubtedly, the 800's makers have been able to save considerable sums in constructional economies. This isn't to say that the keyboard is poorly built – far from it – but in comparison with most other pro instruments, including some of Korg's own, the Poly 800 is a real featherweight. The scarcity of mechanical controls has already been mentioned, and those that do exist are small and light, saving further on production costs. The review sample was perfectly put-together with no faults that I could see, and my only worry is that the 800 may not stand up all that well to the pressures of road use. Digital control is not in any case a particularly convenient way of using a keyboard in a live situation, and it's no understatement to say that the Korg's frailty may well pose prob-

lems if the machine is treated to an extended bout of touring.

Power Supply

To take advantage of the Poly 800's enormous portability (it weighs no more than an average large Casiotone, and is extremely compact to boot), Korg have given it a battery supply, six 'C'-type batteries being housed in a sliding cover on the synth's underside. The only problem here is that the instrument seems capable of consuming these at a fantastic rate, even a set of new Duracells lasting little more than six hours of continuous use. To be honest, I'm not altogether sure why Korg have included this particular facility since no built-in amplifiers or speakers are provided, and although there is a standard quarter-inch headphone jack, this is rather inconveniently located at the rear panel.

Accompanying it are the socket for a 9V mains supply, stereo main outputs, connections for sequencer and program tape-dumping, plus DIN sockets for MIDI in and out. This is of course one of the Poly 800's star features, since it is now comfortably the cheapest professional keyboard so-equipped, and this fact alone should win the instrument a lot of friends.

Conclusion

While it's always dangerous to say that anything is a revolutionary instrument, there's no doubt in my mind that the arrival of the Poly 800 is going to cause some widespread and far-reaching changes in the professional keyboard market. We've already heard rumours of competing products being developed as you read this, but as it stands now, and bearing in mind the slight shortcomings illustrated above, it's an extremely impressive piece of equipment.

If you can live with the fact that it's unlikely to stand up all that well to live abuse and aren't too fussy about the sound details already mentioned, the mere fact that a polyphonic, programmable sequencer- and MIDI-equipped keyboard can be bought for what was monosynth territory little more than two years ago is going to make the Poly 800 very, very hard to beat.

E&MM

The Korg Poly 800 carries a recommended retail price of £635 including VAT, and the importers, Rose-Morris, of 32-34 Gordon House Road, London NW5 should be able to provide you with any further information. Alternatively, you can contact them by telephone on 01-267 5151.

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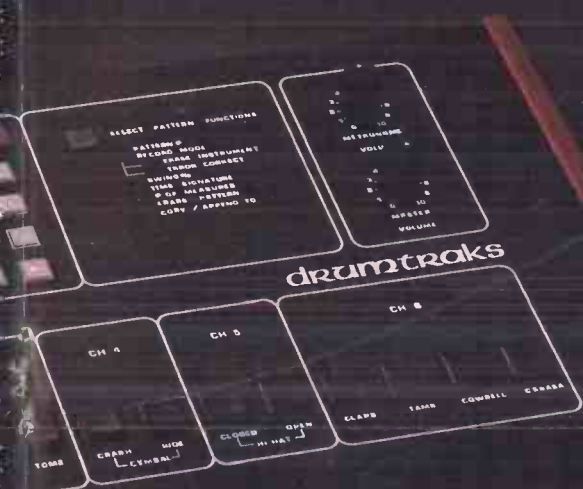
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Siel PX Electronic Piano



Electric and electronic pianos were once very much the poor relations of the professional keyboard market. Only a few years ago the modern keyboardist was faced with a somewhat awkward choice if he wanted something resembling a piano sound without the tremendous hassle of using an acoustic grand or upright for live and recording work. On the one hand there were the great-sounding but prohibitively expensive semi-acoustic models such as Rhodes and Helpenstill, while on the other a wide range of budget electronic designs which more often than not sounded more like synthesisers than pianos, and were often unreliable to boot.

Fortunately, much has changed since those pioneering days. The 1984 version of the electronic piano is a more sophisticated and more versatile animal altogether, and the Siel PX reviewed here is no exception.

Unlike the same company's Cruise mono/poly synth reviewed in last month's issue, the PX is a comparatively new product, and this is evidenced by a somewhat smarter and more contemporary panel layout and general design, and by a greater attention to constructional detail. This extends not only to the instrument's exterior protection against knocks and scratches but also to its interior construction, which is of the highest order and nicely accessible too, which should make any necessary servicing a doddle. There are four main PCBs – two for sound generation and two for connection to the touch-sensitive keyboard – plus a fifth for power supply. All the wiring is neat and orderly and the keyboard contacts themselves are beautifully finished.

Keyboard length is six octaves F to F (actually, F to E, since strangely no upper F is provided), which I consider to be just about the bare minimum for serious professional electronic pianos, though obviously Siel have borne cost and ease of portability in mind when determining its size.

As already mentioned, the keyboard is velocity-sensitive, and perhaps not

surprisingly its action is a lot closer to, say, an acoustic piano or a Fender Rhodes than to a touch-sensitive polysynth such as the Yamaha DX7. Clearly, Siel have reckoned that most potential purchasers of the PX are likely to be accustomed to playing conventional pianos and won't therefore be in much of a mood to alter their playing style, and I think they're right. Mind you, the other side of the coin is that a keyboardist coming to this Instrument after years of playing synthesisers is more than likely to wonder at first why some notes are sounding so much louder than others, and why some aren't even sounding at all!

Effects

In what I would deem to be a fairly brave move, the PX's designers have eschewed such recent electric piano 'developments' as arpeggiators, graphic equalisers, and complex time-delay circuitry in order to concentrate on getting the basic preset sounds (there are ten of them) just right. This does of course leave the Instrument with well below the usual quota of rotary pots, touch-switches and flashing LEDs – by no stretch of the imagination is the PX a knob-twiddler's delight – but it's important to remember that sounds can always be altered to suit the individual's tastes by adding outboard equipment: the same cannot be said of the sounds themselves.

There are in fact two effects – chorus and tremelo – provided on the PX's control panel, but neither of these is variable, or indeed all that usable in most applications, even if the latter can be controlled by one of the two foot-pedals provided. I know this is going to sound like nitpicking, but given the high standard of some other manufacturers' onboard goodies, I think Siel would have been better off leaving these two off altogether, since it's all too easy for inexperienced purchasers to judge instruments on the basis of what would normally be considered insignificant details.

Voices

The ten preset voices don't have names on the front panel (though they do in the instruction manual, not that they're particularly accurate or informative) so for the sake of convenience I'll refer to them by their numerical titles. Tone number one (they call it 'grand piano' in the book, though frankly I can't think why) is really a rather beautiful, sparkling percussive sound, particularly if used in conjunction with the sustain pedal supplied. Just right for those Eno *Music For Films* imitations, though I can't bear to contemplate what Rick Wakeman would make of it.

Number two sounds quite a bit more like a conventional acoustic piano, since its tone is fuller and more rounded than the previous setting, though it's still got enough sparkle to make the instrument stand out if it's placed within a band set-up and/or other keyboards, synths, etc. Voice three, on the other hand, is a good bit too synthetic for my liking (in fact, much the same could be said for numbers eight and nine, as well). All three suffer from quite bizarre amounts of de-tuning and modulation, which, while undoubtedly acceptable – if not desirable – on most other types of electronic keyboard, really do seem a bit out of place in this context, though I suppose someone somewhere will find a use for them.

Voice number four is rather better, as it's quite a reasonable approximation of a Yamaha Electric Grand sound, though still with its own individual character. Voice five is also in a sense an 'imitator', this time with the Fender Rhodes as the object of the electronic mimicry, and again the PX manages to get quite close without running the risk of being accused of plagiarism. Tone number six is similar, though it's slightly brighter and possesses a less percussive envelope.

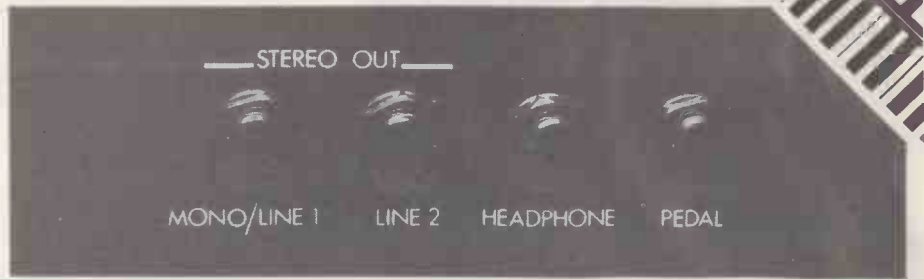
Neatly sidestepping the sound of voices eight and nine hinted at earlier, we come to the last sound of all, tone number ten, which takes a little bit of getting used to initially but in time

makes its mark as being perhaps the most impressive (and certainly the most original) sound on the keyboard. It's a wooden-sounding percussive voice of quite stunning tonal accuracy, though strangely it's difficult to think up a traditional acoustic equivalent for it: the nearest I managed in my notes was 'cross between a glockenspiel and a woodblock'. It's certainly rather unexpected to find a preset voice of such beauty and originality on what is otherwise a fairly conventional instrument; I only wish Siel had developed this particular setting a little further by providing us with a couple of tonal and/or octave variations on it in place of the synthetic de-tuned presets mentioned above. Still, you can't have your cake and eat it...

There is in fact an eleventh preset voice in the form of a separate bass section which covers the lowest two octaves, and whose volume can be controlled individually by means of a rotary pot located on the front panel. This is actually quite close to the lower end of an acoustic upright, but the unfortunate aspect of this is that the sound doesn't combine particularly harmoniously with any of the other preset sounds, unless you're playing a gentle, slow-moving piece. Pity.

It's possible to combine two of the preset voices together by holding down the button of the tone first selected and simultaneously switching in a second. Surprisingly, this can be very effective indeed: combinations that work particularly well are one and four, two and five, five and six, and six and ten. It should be mentioned that while most of the voices on the PX benefit from judicious use of the sustain pedal when used singly, the same cannot be said for the combinations outlined above, as things do tend to get a bit confused or, worse, distorted, particularly at the keyboard's lower end.

The Siel's rear panel includes provision for headphone monitoring as well as stereo connection to outside amplification, and the foot-pedal socket. All of these are standard



quarter-inch jacks, which is good to see.

Conclusion

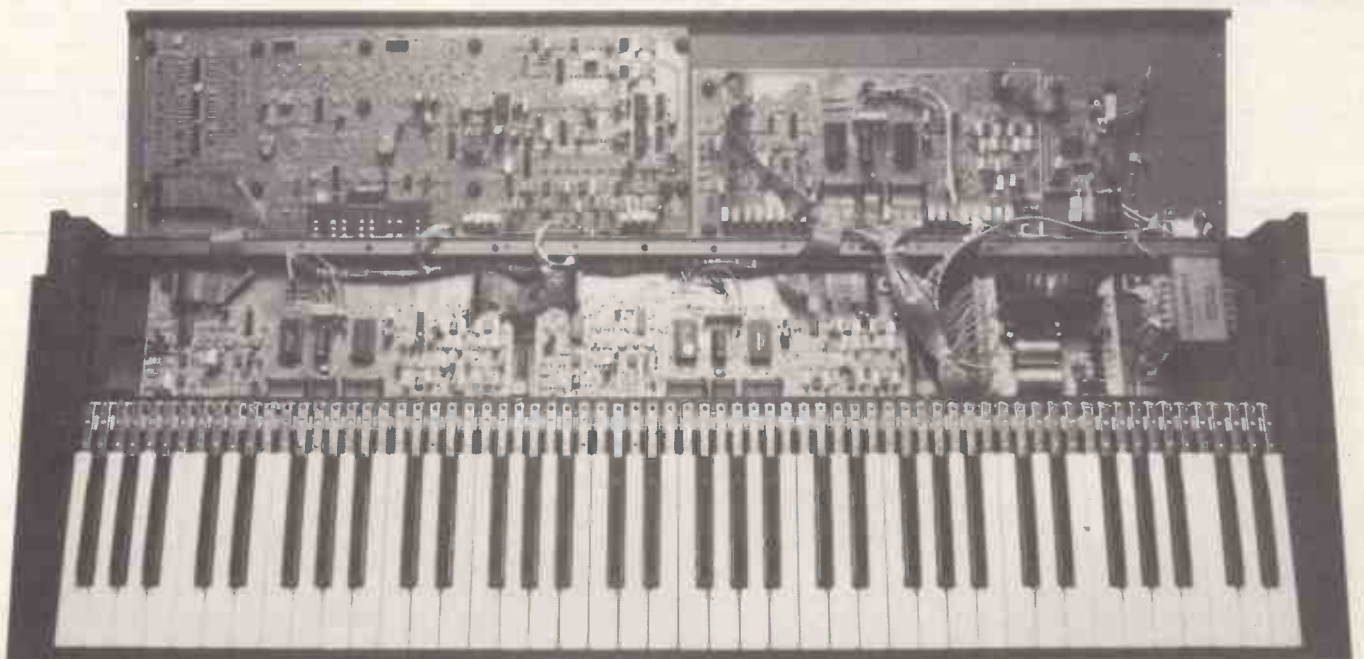
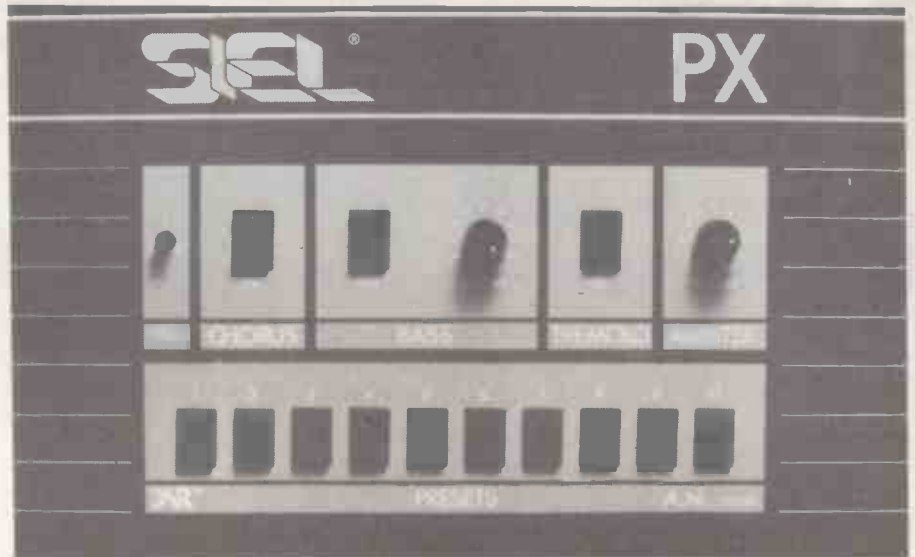
Summing-up on the PX is a little difficult, bearing in mind its fairly hefty price-tag. With all sorts of cheaper competition from the new wave of fully polyphonic, MIDI-equipped, programmable synthesisers, it seems unlikely that many general purpose keyboardists will find the PX's expense warranted. On the other hand, committed electric piano enthusiasts (or alternatively, pianists who want a fairly

painless introduction to the world of electronic instruments) will find the Siel a godsend, since in addition to its fine sound capabilities, it's reasonably compact and light to carry, would seem to be equally suited to both studio and live applications, and is extremely well-constructed.

Dan Goldstein

E&MM

The Siel PX Electronic Piano has an RRP of £749 and you can get further information from Siel (UK) Ltd., Suffolk House, Massetts Road, Horley, Surrey, RH6 7DT. Tel: (02934) 76153.





DON AIREY

WIZARD OF OZ



Behind the makeup, the excesses, the volume and the images of heavy rock lies a world of concentrated musicianship and dedication. Don Airey has been a part of some of the most influential and important rock music of the seventies and eighties — and reached one peak earlier this year — simultaneous album and single number one hits with Ozzy Osbourne's 'Bark At The Moon'. Here he talks to Tim Oakes about his approach to rock keyboards, and the world in which they are played.

The studio band: Jake E. Lee, Bob Daisley, Ozzy Osbourne, Tommy Aldridge, Don Airey.

Ozzy really isn't the madman that everyone thinks of him — basically it's a product of the publicity machine. We lead a very nice life on the road really, we live on the bus and we tour at night, leaving just after the gig and getting to the next place the next day. That means that if you have a day off then you can spend it in a town — rather than belting along the freeways.

It all gets made so much easier when you have a good pro road crew — this time, in addition to the PA crew the lighting crew, the stage crew there's about twenty people, plus the band and assorted people too. But then, there's a lot to do — like the stage set itself which is incredible, it's like a huge cathedral organ that goes up and down... we would have liked to have used that in the U.K. but the venues here are just too small.

I have two keyboard sets, one is over here, and one is always in the States. There's a CS80 which is the basic keyboard, a MiniMoog, the Roland Vocoder Plus, Yamaha CF70, Oberheim 08Xa, and a MemoryMoog. To them I'm adding a DX7, another MemoryMoog (because I use it so much), and the Wave 2.2 and the Waveterm. Other keyboards I've used recently are the Poly 6 which is quite amazing, a Korg Organ, and the Pearl electronic keyboard which is not widely known here, but is quite popular in Japan. You can get a Fender Rhodes sound, or even a Wurlitzer sound from it. It's a strange keyboard really, it's touch sensitive but I use it a lot, especially when I'm doing a jazz gig. I play around the local

pubs a bit when I'm 'off the road' and that's the keyboard that I usually take.

Most of the keyboards that I've got I've had for a long time — I've had the CS80 for five years now. In fact, the one I've got now is a new one — the last one got dropped and I had to rush out and get another while it was away. The thing is — they really are very heavy, they weigh around 200 pounds and no one in their right minds would buy one now — but I think they are tremendous. They really stand up extremely well to some rough handling on the tours. The only real accident was that time it was dropped. It was on the Ozzy tour two years ago and I was up on the battlements of this castle, and they hoisted all the gear up. Inevitably half way up the sling slipped — and down it went. To cap it, a young gentleman from Milwaukee claimed he knew all about them and he'd fix it — and he blew it to pieces! I came in and he's standing in a cloud of smoke... I wept.

But breakdowns, thankfully, have been quite rare — but when they do go, they all go at once. The last Ozzy gig we did, in France, three bits went down simultaneously, the MemoryMoog, the 08Xa and the echo machine — and it just so happens to be in the middle of the solo keyboard section! I did a lot of praying... I just switched the CS80 over to the Church Organ sound in time and managed to scrape through.

The organ sound that is on *Bark At The Moon* was done on the MemoryMoog — and I actually helped them to get the sound on the prototype. Val Pulasinski played it to

me, and I nearly fell over — it's a fantastic sound. Val actually told me that he went along to his sisters wedding, and just took that along!

Undeniably, there are real problems with being a keyboard player in a heavy metal band, and not least the guitar. First off, the guitar is very loud, but also the guitar is an amazing instrument, it is very expressive and you just have to listen to it. But what works for me is trading ideas with a guitarist. Almost any keyboard can sound great on its own — especially in the studio, you put a bit of Lexicon on them, down into stereo and wham! It's wonderful. As soon as the guitar comes in it vanishes. So you have to hone your sound very much so that you have something that can compete with the guitar and also to get right behind it. I try to get a blend with the guitar so that we can support each other. Over the years I've obviously worked with a lot of guitarists, and there have been varying levels of success, but between Gary Moore and myself there is a sort of bond. We've worked on a lot of things together which sort of came to a level on *Variations* — what a long time ago that was!

I listen to all sorts of music, but obviously there's an interest in the heavier end of things. I do listen to other rock keyboard players — I have to know what they're up to! Eddie Jobson is a very good friend of mine (we used to live next door to each other in Finchley) and it wasn't so much exchanging ideas, more a sort of "beat this then...!"

Eddie has always impressed me as a

player. . . we kind of 'discovered' the CS80 together at a trade fair and we both jumped on it. It's still his main keyboard, I think on Zinc it was just about the only keyboard that he used, with a bit of MemoryMoog thrown in. Quite amazing.

The CS80 was the instrument for me up to about six months ago. But with all the new sounds that you hear – especially in England – it seems the new bands really have taken the new digital keyboards and made a start for the future. The sounds are quite new, and I really feel that digital is going to be very important over the coming years.

It's really the clarity as much as anything that appeals. You can really hear the difference folks! I've just ordered a DX7 and that's waiting for me over in the States. I played one in Rod Argent's not long ago, and I'm itching to get my fingers on one again.

Music Lessons

I started playing when I was about three, my Dad was a piano player and he set out to teach me all that he knew, which lasted until I was about seven when he said "Right, that's it! Music teacher time!" I went up through the usual grades, and when I was 13 or so I started playing in local bands. I was always very keen on jazz and I started there at school in Sunderland with little groups.

I also played the church organ – which could explain the various bits of organ playing I throw in now!

I did go to University, but I spent more time playing than studying there. . . I was doing English as well as music, but that got a bit neglected. Again I was playing with the jazz thing, and through University I got involved with the revues they put on. Eventually we took a show up to the Edinburgh Fringe Festival. While we were there we were spotted by a London Weekend Television producer, who bought the show and all the songs, so I got involved with TV. At 19 I was working on the Roy Hudd TV show, which was around '69 or so. After that I went to the Royal College of Music in Manchester for a year to do a piano course – I really couldn't believe that I got in there. I had an incredible teacher there called Richard Backs, to whom I will be forever grateful. But I got bored with being a student, so I went out again into the big wide world with a band that I formed while I was at college and we got work on the P&O Liners going round the world.

It was marvellous, a great job really. They had some superb acts on those ships and I learned a lot about shows and playing live from that. It was an idyllic existence – on twenty quid a week!

Hammer

I carried on travelling for a bit after I left P&O, to South Africa and the Far East, and then back to England where I joined Cozy Powell's *Hammer*. Meeting Cozy was one of the great days of my life – I'd never seen a drummer play like that ever. Not just a kick up the backside but a kick up the whole system. I auditioned, and I was setting up and he was putting on these great big boxing boots and got hold of these great big sticks and started beating hell out of the kit. I suppose that gave me the training to play over something that was very loud, indeed. . . if you can play over Cozy you can play over anything.

We toured with *Hammer* for a while, and then I met Jon Hiseman and Gary Moore and we formed *Colloseum II* in the wake of the Mahavishnu thing. I still get people coming

The stage band: Carmine Appice, Jake E. Lee, Ozzy, Bob Daisley, Don Airey.

up for me to sign the old albums from that time, and it never fails to 'bring back memories' – I really felt that was a great band. One of my dreams is for us to do another album. Jon is working now with Rod Argent in a band, plus of course he has his studio and the record label – ever the entrepreneur, but then drummers are, I've never worked with a poor drummer. . .

Rainbow

After Gary left *Colloseum II* we carried on a bit with my brother Keith, but I fancied something a bit heavier. Then Cozy rang up and invited me to work with Richie, and I was a bit doubtful, but we got on great – for the first year, or at least that first album we did, *Down to Earth*. That was basically me Cozy and Richie. Then Roger Glover came in, initially as the producer and then subsequently at the bass player and we eventually found Graham Bonnett after about six weeks of recording, and the band was born. It was a truly *English* sound, very heavy and melodic and beautiful. Donnington festival was the next triumph for that band, and then inexplicably Richie let Graham and Cozy leave and he brought in American musicians which was fine and great, but he tried to go for a sort of Foreigner sound – much more commercial, which I felt was a mistake. We had four hit singles altogether, two from each album, including *All Night Long* that brought us in new audience altogether, but after that, the stage shows became, well, mistimed I think is the best term, and I handed in my notice and left at the end of tour – which didn't go down well. . .

I never really expected us to have a hit with the new Ozzy material, not because it isn't good, but just that it's not the sort of thing you hear on Radio 1. It came as a shock to everyone, but we had a few inklings that it was going to be big. We did a signing session in a record shop, and the manager of the shop came over and said "You've just sold 400 singles. . . you've got a hit." I think my knees went. . .

I've been associated with Ozzy for about two years now, and we've put the two albums up together. Also, though I don't think a lot of people know, I worked on a *Black Sabbath* LP, *Never Say Die*, but I think I only get a credit on the English version and not the American one.

Studio

Bark At The Moon (the album) was actually mixed twice. The first was quite professional and everything, Max Norman did that one, but he'd been working non stop for six weeks on it, and I think his ears had gone. So they took it to a guy in New York called Milo

Bodjovani and he did it in three days, zap zap zap. Which is why the whole thing sounds so fresh and sparkling. There are rough edges in there, but you can hear everything on there. I think a lot of that was Max, and the studios that we used, Ridge Farm. I like high tech sort of studios, but Ridge Farm is so nice to work there. We started on August 1st, and six weeks later the whole thing was finished.

I suppose we could have done it even quicker than that, but Jake took a lot of time getting the guitar sounds just right – and they are – which for his first album was marvellous. We literally watched him grow as a musician as we recorded it. I think he was very scared of being himself when we first started, he followed the stereotype of how he should behave in a studio, and it took a time for him to settle down and be Jake.

The writing stages before we even started at Ridge Farm took about six weeks really. On and off, we sat around and banged away with Ozzy singing things off the top of his head as a start. Then we sifted through all that and Ozzy began to form specific ideas. Some of them came up very quickly, like *So Tired* took about four minutes! Ozzy came in and went "Oh Oh I've got it, quick!" and there it was. It's a strange sound that one, and an odd track out in some ways. The piano sound there was done on the Yamaha. At Ridge Farm they had this beautiful old Steinway – it's the one that I used on *Revelation Mother Earth* on the *Blizzard of Oz* album but we couldn't get the sound this time, and I wasn't happy. Recording can be agony for me, I worry for a long time over what I've done and could I have done it better.

So Tired took just two takes, and Max said "Well, it's not so bad, do you want to listen to it?" which from Max is rare praise, so I left it as it was.

Almost all the keyboard material for the album was recorded in a couple of days. That's a way that I like working because I like to have a bit of pressure. If I get left to think about things I start to worry, and if I start to worry I start tampering with it and it takes forever.

If you work quickly, conversely, you came up with more 'off the wall' stuff – like the growling sound we got on *Bark At The Moon* which was the CS80. It must be the best sound that I've ever got out of the CS80 and I've lost it! It's in there somewhere, so I'd better get looking.

Strings

The string sound on the album were thickened up using the OBXa, and the 'real' ones were recorded by Lou Clark. I really feel that there is no way that you can get a really



good realistic string sound through a synth though. Which brings me to the fact that I am starting to feel the constraint of electric keyboards because it is, per se, a mono signal, there in the air, and there's not a lot that you do with it. This is especially on strings but also applies to piano sounds. There's a certain feeling in a piano sound or with the Royal Philharmonic that you just can't get via a keyboard.

I have worked with the Fairlight and the Emulator. But I find the Fairlight very cumbersome, and the Emulator is just like a digital Mellotron — and I don't really like Mellotrons, though I did find that I used them for a while. They even used to have them up in the working mens clubs up north.

Stage Sounds

Playing live with a band like this can be a real headache — literally. Jake is very loud indeed, and Bob is earthshaking, and then you have Carmine Applshce there between them, so I started using the Yamaha Tone Cabinets. The new ones, which are loud enough, are great — but the only problem is their lack of bass. They allow me to have a reasonable idea of what I am playing at the time, which can be a big problem. That guitar... Jake really does give that guitar a damn good seeing to, which causes problems in itself. There are sounds that you get from the guitar specifically when you play it that loud and I think Jake has found all of them, and some great new sounds, but the sheer action of playing so physically makes the tuning a bit volatile. With the bass and the keyboards playing against Jake, the bass can get away with it, but if I find that I'm out of tune there's not really very much I can do except to take it back a bit. But, when it works, it really does work and the sound is so full and powerful.

The System

I've recently started to mix my own keyboards on stage. I suppose it gives me a little bit more freedom at that stage. All the keyboards go through Moog Synamps, and I use the Roland RS501 — that's the Chorus/Echo one, the CS80 goes through that, with the chorus on and just a little bit of reverb. The CS80 signal then goes through its own Synamp, but the others are fed through the Lexicon PCM41, which is one of the early ones — the best really — they give such a superb sound. It's a bit like the old Echoplex I suppose but without any of the problems. After that the whole lot are fed through the Dimension D so the guy on the mixer gets a stereo mix of all the keyboards. He also takes his own signal from the piano and the Vocoder separately. He treats the Vocoder sound out at the mixer desk with a Lexicon digital reverb and harmonises it — which forms the 'monks' sound at the beginning of *Forever*. I have to do that on my own on stage, along with the special effects. I'll give you an idea of what I do on stage: we have a haunted house backdrop which they flash lightning effects across while I'm making thunder and 'Vincent Price' noises which are done through a program run on the MemoryMoog. (One of those sounds is a reverse gong sound. I was experimenting and managed to find this incredible gong like sound, it even made Carmine go "What the hell was that!" But I switched it into another patch and put it into reverse. That's one of the lovely things about the MemoryMood — but it is the Last Of The Great Analogues. It was such a natural step from the MiniMoog and all that I learned there. The key to the whole thing is the third oscillator sweep modulation). But back to the stage show... I switch over from the Moog on a big filter delay which

takes me over the CS80 for the bell sounds — and I'm not telling anyone how I get that sound — I've been offered money for it! So, I'm doing the bell with one hand, and the bass note on the MiniMoog with the other hand, and singing, and dancing... I ought to get Lionel Blair in to choreograph it... Just after the monks bit is the church organ and again, I'm running around to get to that one in time. Getting all that sort of thing right took a fair proportion of the rehearsals. You have to get that movement right, and have everything placed just where you need it, then you have to work out all the settings, and what's to come in where and when. After all that, you have to ask yourself — 'What will I do if it goes wrong?' There is no way you can say 'Oh it broke' or whatever, you have to develop the alternatives to everything so that you can patch up if you get problems.

Ozzy

When I first worked with Ozzy, I was still working with Rainbow, and kind of crept off down there. They had had problems getting a keyboard player in, and I went down there for a day to see if I would help. It went like clockwork, and I was very impressed with the way that Ozzy worked. That first Ozzy band with Randy Rhodes and Tommy Aldridge, I feel that was the best band that I have ever worked with, and that *Blizzard of Oz* LP bears me out I think. It has a sort of overall sound to it that is hard to get, but when you get there, well you know you've arrived.

There are always stories of what Ozzy gets up to on the road, and a lot of them are a bit short of the mark... but there are fun things that go on. There are times when you daren't go to sleep. They got one guy drunk, and dyed his hair bright red. I had a lucky escape — I got sozzled in Hamburg (not like me at all — honest) and we got arrested for something or other, and, to cut a long story short, I woke up in my room in the morning thinking "Oh no, Ozzy was in here last night... what's he done!" But I got away with it. Eyebrows intact.

Solo Album

When I'm not on the road, I play a bit with my brother, who is the guitarist with Mari Wilson, just a few jazz rock things, and I'm planning to do a solo album after we come back from the States. It's going to be a 'heavy' type thing, but with heavy keyboards. The art of heavy rock keyboards has been a bit thin on the ground really, not a lot going on there, and I'd like to try and get some of the ideas that have been building up for years down onto tape. I'd like to use the MiniMoog more, there are lots of sounds there that are applicable — like a good guitar sound that might come in useful somewhere...

I haven't got a studio as such at home, just a music room that seems to be full of old keyboards — elephants graveyard. I've never felt the need for a studio there, in fact I've been using the Sony Walkman professional model lately — just to get some of the sounds down, and some of the melodies recorded. I like the idea of being in a band and going to the studio to make an album — I just can't imagine doing one at home, it would be so boring.

I think that I might actually buy one of the Sony digital PCM series for working at home though. With the digital sequencer on the PPG I think that might be a nice match. I can record then on the keyboard and just run it off onto the digital recorded. That must be that way the things are going to go. But ideas like that — the technology — have to be set up against the natural ideas I have. I

try hard to keep my piano playing up, playing a lot of Bartok.

One of the problems on the tours is the concentration — and getting the practice in. I take the little CS01 with me which I plug into a rockman so I can leap around the hotel bedroom pretending its me playing all the lead lines and not Jake... Which you can do with those rockman. You can plug them up to the PA, but I tend to steer clear of effects — they are just one more thing to go wrong. Plus there is the fact that no one would hear them really, all they will hear is the keyboard. It is a discipline — I can't hide behind the effects as such, so the keyboards have to do the work. I suppose that's why I find a keyboard that I like and hang on to it, learning what it can do from top to bottom. I also find that the keyboards themselves have a certain quality or character to their sounds. If you like, every CS01 sound is the same — in that *quality* at least. With the MiniMoog sounds, they thought that they had managed to reproduce that sound on the MemoryMoog. They said that they'd taken all the sounds down from the MiniMoog and that they had truly reproduced them on the Memory.

Well, I went to do some work with Gary Moore, and left the MiniMoog at home. We were doing all the dual lead sounds, and he kept giving me this funny look. Eventually he said "Don, it isn't happening you know..." so we brought the Mini back, and we were back in business because we knew the *character* of the sound that we wanted — a type that just wasn't available on the Memory at all.

I wonder if the makers actually envisage what the muslclans are going to find out on their keyboards and whether they have an idea of the capabilities. Like the MiniMoog and Jan Hammer — who for me is the Guv'nor — and some of the incredible things he's done, like the theme for *The Tube* which is absolutely superb. It's from the Jeff Beck album *There And Back*.

I just wish he'd sort of come out and do some more. But then I think he's obsessed with being a guitar-type — with his keyboards chained round his neck... You can never be the big guitar hero type on keyboards. I've given up even trying — I've got my little space in the corner of the stage, even if it does look like a music shop. I don't think that the keyboards are in the right place at the moment, (I'm off the stage right sort of pushing onto the stage) but before, I had the keyboards up beside the drums on the podium at the back behind the bass. That didn't interfere with the visual style of the band — and I got to see what was going on down there. In fact I have tried going out to the front, when I was on tour in Japan with Gary, with the Yamaha CS01. But when I got out there with this thing round my neck — I felt like an icecream salesman.

I'd never picked up an electric guitar until recently, when I was working with Gary and had a go on his Les Paul. I thought it was about time that I actually had a go. Well, I tried, but I just can't work out how on earth they do what they do. It's like how a violinist gets to develop a sound. The system for keyboards — and especially synths, is no less personal, but there's something physical about playing the guitar that is more intense than the keyboard. Hard to explain, but even harder to play the damn thing.

About the only intensity that you can feel in my situation is on the grand piano. That has a real edge to it in terms of the way that you play simply through the physical way that the instrument makes its sound. The factors are you, rather than an envelope or a filter or anything, it's your fingers, out there on their own."

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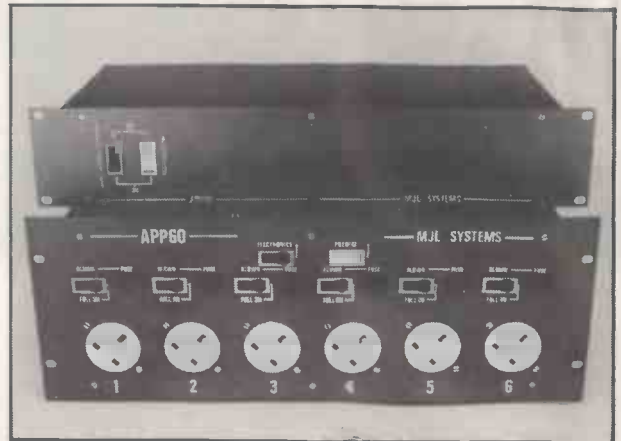
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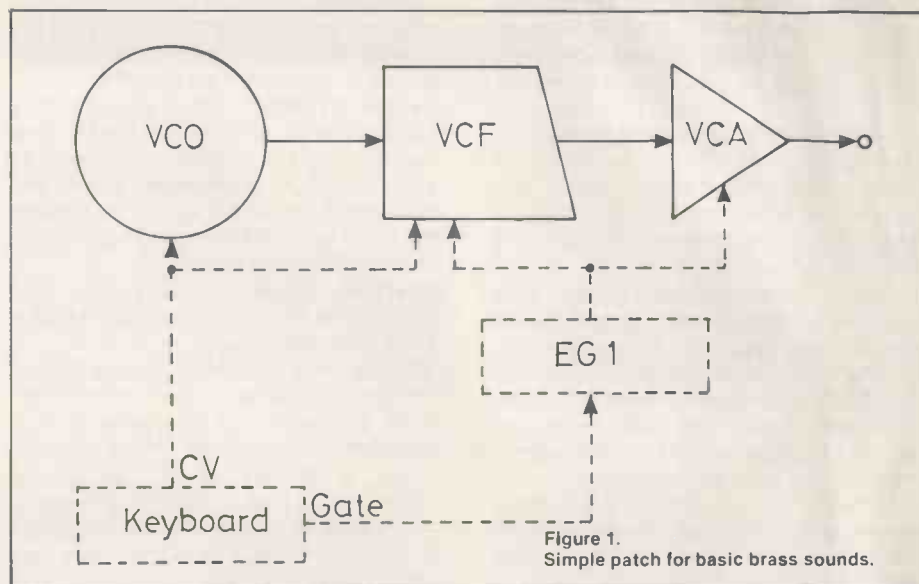
The topic of this month's column is brass sounds — and how to create them using a modular synthesiser.

Let's first have a look at how brass instruments achieve their characteristic sound. When a note is played on any brass instrument the fundamental is the first element of the sound that we hear. This is quickly followed by a fast, progressive build up of both odd and even harmonics and it is this harmonic movement that gives the characteristics 'wah' effect that is at the front end of every brass sound in one way or another. Accompanying this effect, however, are all the various 'human' elements such as overblowing, inaccurate tonguing, etc., which give rise to all the blurts, squeaks and other bits of dirt that characterise brass sounds. Setting up the 'wah' effect is fairly straightforward but the other elements require a bit more thought and hardware.

As with string sounds which we have already looked at, there are a few ways in which you can produce brass sounds which are covered separately below.

Method 1

The simplest way to produce a brass sound is to use the sawtooth output from one of the VCOs and to set cutoff frequency and resonance to minimum with maximum sweep from the EG. The attack should be set to about 500ms so that the filter sweep will give the 'wah' effect required. The decay and release should also be set to about 500ms with the sustain set at approximately 80%. Adjustments can be made to 'fine tune' the sound to your exact requirements but these settings should give a pretty good brass sound. To improve further



the harmonic movement you could try mixing in a pulse wave whose width is being swept by the EG. This will add a touch more 'bite' to trumpet sounds in particular.

Method 2

As with strings, it's possible to use two VCOs to create a richer sound. In this instance, however, we are going to use an EG to sweep the pitch of the second VCO in order to try and create the 'blurtiness' of brass instruments. A patch for this is given in Figure 2. The VCF and EG controls are set pretty much the same as in Method 1 but as you can see, another EG is routed to VCO 2. By tuning VCO 2 an octave lower

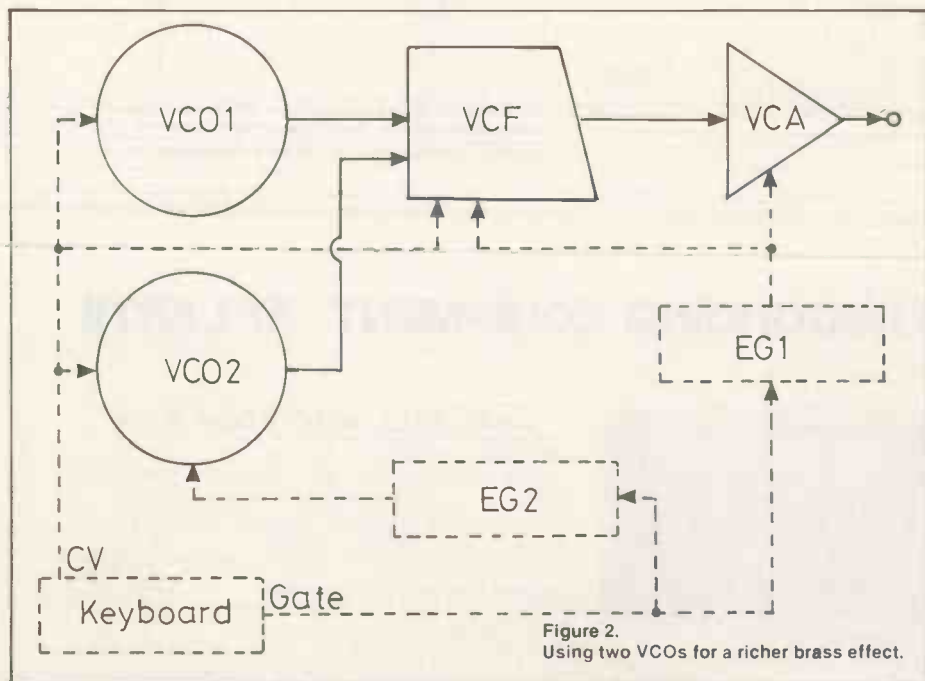


Figure 2. Using two VCOs for a richer brass effect.

than VCO 1 and then adjusting the modulation level of the EG (whose ADSR controls are set practically the same as EG 1) so that VCO 2 rises an octave to match the pitch of VCO 1 you will hear the effect I am trying to describe. Adjustment of the ADSR controls of EG 2 will yield some interesting and varied brass effects which can be used for a wide variety of purposes. If you find the sweep of an octave too much, try tuning VCO 2, say, a fifth below VCO 1 and adjusting the EG modulation amount so that VCO 2 is in tune with VCO 1.

Points to watch in this method are not to set the decay and release times too long (ie. more than about 500ms), otherwise the effect will be that of pitch bending instead of the 'squeak' you are trying to obtain. Also, don't detune the VCOs against each other but get them as close to unison during the sustained portion of the note.

Method 3

This method utilises even more hardware than the previous two, but is capable of providing a very realistic range of brass sounds indeed. I suggest that to begin with you use the simpler techniques of Method 1 but to this you can add a touch of distortion into the filter to introduce the overblowing characteristics of brass. Patch up as in Figure 3 so that the sinewave output of a VCO or the output of an oscillating VCF is fed into another CV input of the VCF via the EG/VCA combination. The frequency of the sinewave should be about 100 Hz (although there's plenty of room for experiment if you're looking for different effects) and the EG 2 should be set to give a very

short envelope with absolutely no sustain. Again, experimentation with the ADSR controls will give various effects. This will give a short burst of modulation at the front end of the note which produces the 'farting' effect present on many brass instruments. With careful adjustment of the modulation level the effect can vary from subtle to harsh, though some messing around will probably be needed to get the exact effect you want. By routing the EC 2/VCA 2 via a footpedal you can introduce the effect as and when you want. Using a single triggering system might also help here as you could vary the effect with your playing technique; playing *staccato* will give the 'blurt' on every note while playing *legato* will cancel the effect, and it will only be heard when you release the keyboard and play a new note.

These three methods should give you fairly good, all-purpose brass sounds. You might like to use two EGs on the VCF (as discussed in E&MM, October '83) to create a more complete envelope shape, and this technique can be applied to any of the above methods for even more variation.

Different brass instruments have quite a different tonal characteristics, however, so it's a good idea to look at each one in turn.

Trumpet: A very bright, brassy sound. Use Method 2 with a wide filter sweep and as short an attack and decay time as possible. Be careful not to lose the all-important 'wah' effect.

French Horn: These are more muted than trumpets so decrease the filter sweep and increase the attack and decay times. Method 3 is probably the best one to use with a soft 'blurt' on the front end of the sound. A soft tremelo on a VCA is also recommended if this is available.

Trombone: Again, use Method 3 but set up a wider filter sweep and a faster attack time. The 'blurt' is harsher on trombones than on horns so increase the modulation level of VCO 3 a bit. Pitch-bend, slow vibrato and portamento (especially fingered portamento) can be used to great effect as well.

Tuba: Quite a raspy one. Play low down in the bass end and use a bright tone but a slowish attack (not too slow, though) because, as with most instru-

ments, the bass end takes longer to 'speak' than the top range. Again, Method 3 is probably the best but any of them will do.

Those, then, are the four main types of brass instruments. I would imagine you could try and synthesise other sounds such as Flugelhorns, Cornets and muted effects. These can be obtained by 'tweaking' any of the above.

Phrasing and playing technique is also important in trying to recreate the sounds more accurately and the main points to watch are as follows.

Length of Note: Brass players only have a finite amount of breath and cannot sustain a note indefinitely as you can on a synthesiser, so try and split the musical phrases into smaller sections so that the sound can have a chance to 'take a breath'.

Intervals: Wide intervals are also difficult so try not to have too large a jump between notes.

Vibrato: This is almost impossible for all brass instruments except the trombone so avoid it if you want a truly authentic brass sound. I must admit to using it myself as it *can* sound effective, but it won't be totally realistic - tremolo is better. The same applies to pitch-bending but, again, this can sound very effective.

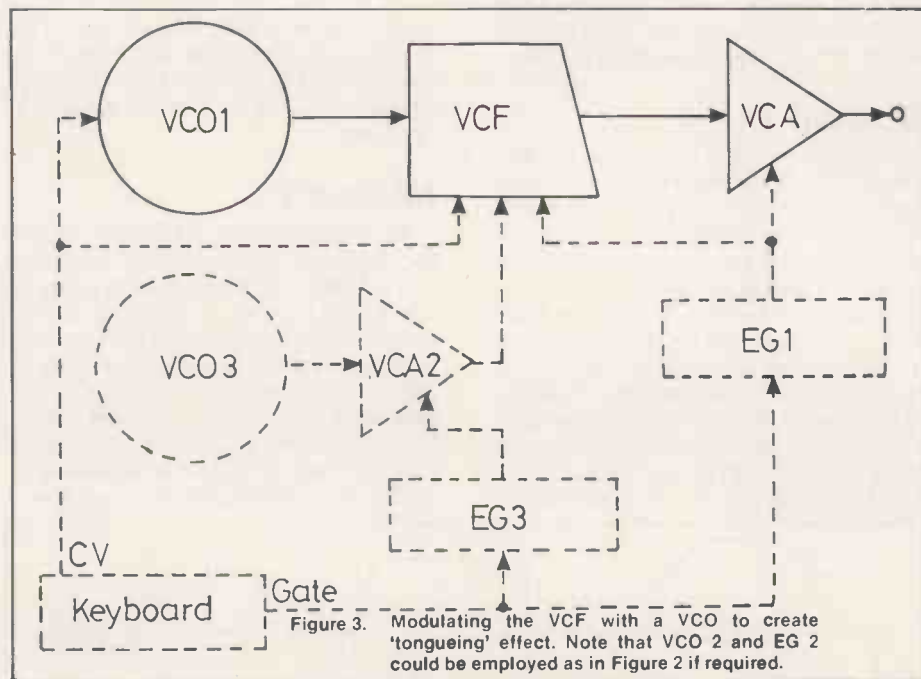
Voicing: Brass sections don't usually play the block chords so beloved of keyboard players so try and space the notes out a little. You'll find they play a lot of 5ths, 6ths and soon but rarely a straight triad. Orchestrating your brass section will give you far more effective results than just playing the block chord and I advise you to listen to 'real' brass sections to hear how they voice their parts. Try not to go overboard in the amount you play either: some brass sections only appear for an occasional 'stab' on an accent. As we discussed with strings last month, try and record each part separately and adjust the tone of each instrument slightly for more variation.

As with any synthesiser sound, effects can play an important part in the final sound but for brass you'd be better off just sticking with reverb (not echo) unless you want a special effect. Chorus and/or flanging might beef up the sound but it can sound too 'electronic'.

That just about concludes this month's workshop. You'll notice that I've not included saxophones. This is because they fall into a category of their own by virtue of being both brass and reed instruments, but we will be taking a look at them soon.

Steve Howell

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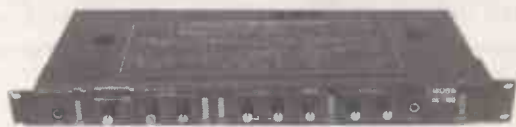
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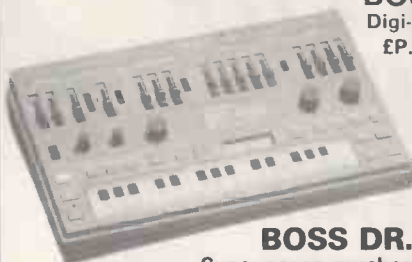
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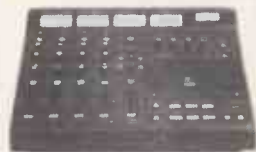
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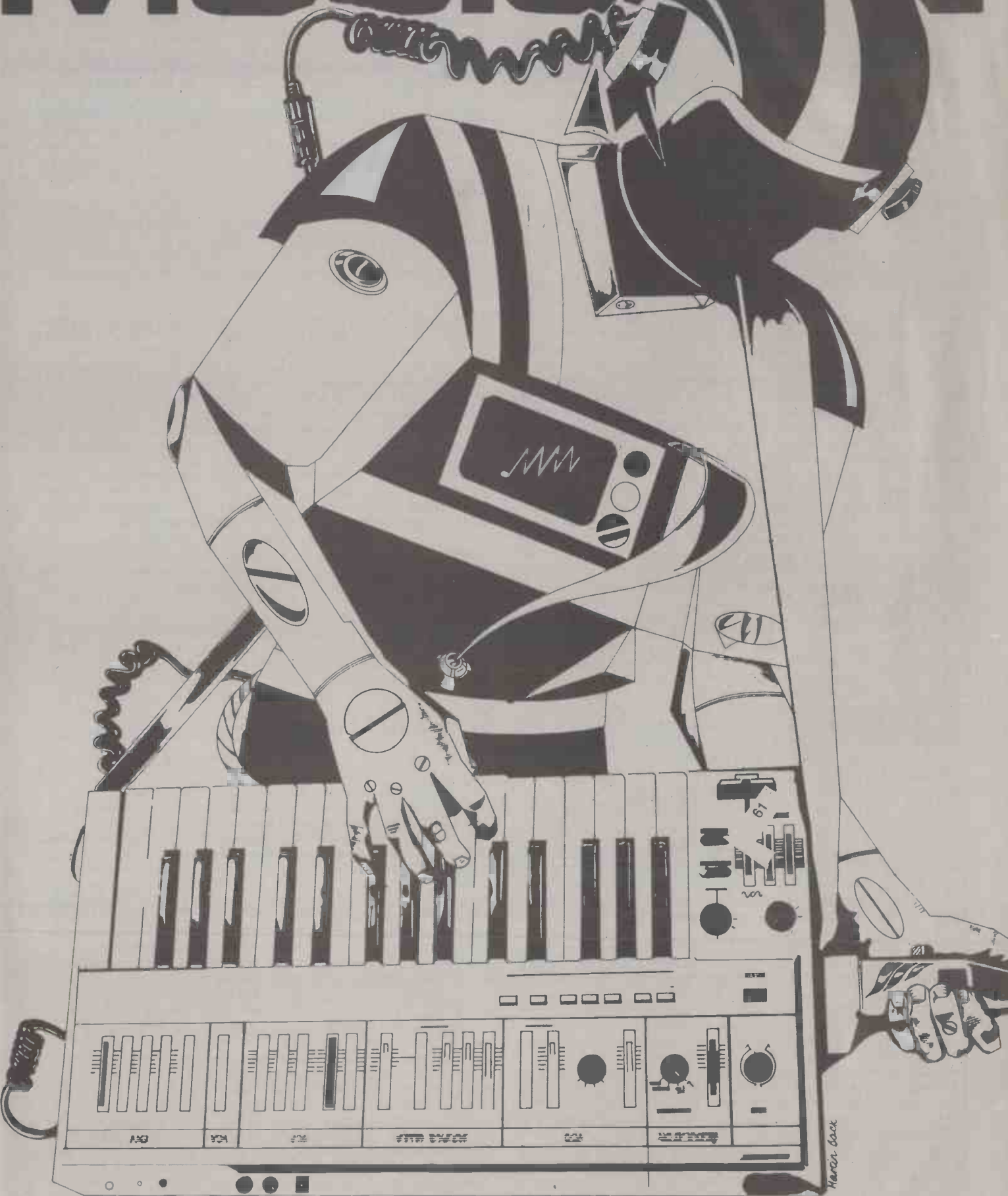
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Computer MUSICIAN



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Rumblings

Action Replay

Lots of movement on the British front this month. Jolly good show, too. First to kick off is Ricoll Electronics and their 'Action Replay' (Frank Bough, eat your heart out)...

The basic premise of 'Action Replay' is to act as a sound sampling add-on for the 48K Spectrum. In fact, Ricoll have been beavering away in all sorts of directions to further the musicality of the humble Spectrum, and this, their latest offering, should offer the Computer Musician plenty of food for thought. Anyway, specs for this go as follows:

Input sampling rate: up to 32 kHz
Sound storage: 32K
Storage time: 1 to 8 seconds
Overall S/N ratio: -66 dB
Quantisation noise: -72 dB
Distortion: not audible (!)
Filter: -36 dB/octave on input and output
Frequency shift: at least +/- 4 octaves
Controls: mix and feedback
Options: vibrato, glide, and CV input

What Action Replay comprises is a single box of tricks (rather than the three of a competitor's product) that connects to the Spectrum's edge connector. By using companding chips for the DAC and ADC, the unit is capable of rather better quality than is customary with the sort of 8-bit sampling techniques used in the Decillionix DX-1 (reviewed in CM a few issues ago) or the other sound-sampling Spectrum add-on just alluded to. With the hardware come various software routines that allow sound to be recorded, played back in straight or reverse modes, looped around selected points for a glitch-tree sustain, harmonised +/- 2 octaves, and echoed from 1 to 8 seconds.

Other software modules are also available, and these include Fourier synthesis and analysis, waveform drawing, and real-time spectrum analysis. It's also claimed that the software will be compatible with Microdrives so as to facilitate fast(er) retrieval of sounds. Another interesting addition that'll be following shortly will be a module that allows voltage control of the sample playback frequency from any 1v/octave synth or sequencer. The only pricing detail we have at present is a tentative 'about £99' for the Action Replay hardware and standard software. For more info, contact Eric Bulmer at Ricoll Electronics Ltd., 48 Southport Road, Ormskirk, Lancs. L39 1QR (tel: 0695-79101/4).

Clef Computer Music System

Back in October's 'Rumblings', I mentioned that there were a couple of Programmable Digital Sound Generator add-ons of near-neighbour origin about to appear on the market. Well, it seems that it's the Clef 32-channel, 32 kHz sampling-rate one that's made it first, and what follows are the provisional details of how, why, and what it's all about.

Basically, the PDSG consists of a fast DAC that's time-multiplexed 32 ways, so that, in effect, one ends up with 32 'logical' oscillators, each being fed their own waveform samples from on-board RAM and ROM (up to 8K in toto), as well as control bytes for setting frequency and amplitude. In comparison, the Mountain Computer MusicSystem hardware used by the alphaSyntauri and Soundchaser systems has only 16 oscillators.

These are fed waveform samples from the host's memory via direct-memory access which halves the effective speed of the processor. So, whereas the 6502 in the Apple is forced to run at 500 kHz when the MusicSystem is in operation, the Clef PDSG leaves the 6502A in the BBC Micro running full-speed at 2 MHz, ie. giving four times the computing power, and that, of course, can be used for controlling more parameters in less time.

One of the major complaints levelled at the MusicSystem hardware is the excessive amount of noise coming through when no sound is actually being outputted. To get around this problem with the PDSG, hardware noise suppression has been added so that inactive oscillators are automatically silenced. A further limitation of the MusicSystem lies with its inability to respond fast enough to what's going on around it. The problem lies with the rather slow on-board interrupts generated every 8ms. Since these direct the frequency and amplitude updating of the oscillators, it follows that the earliest a keypress can be turned into sound is 8ms later, and that's with everything working optimally. The long and the short of this is that chords are uneven and percussive attacks fall a long way behind what they're actually meant to be.

Clef's PDSG, on the other hand, is capable of responding with an edge rate of just 2ms if that's what's required by a particularly percussive attack. Another significant improvement over the American system is that all 32 oscillators can be assigned to left, right,

and centre positions in a stereo field, whilst the MusicSystem is hardware-fixed to 8 on the left and 8 on the right.

However, to make all those 32 oscillators earn their keep, they've got to be used in an intelligent fashion, which is where Clef's system really scores over those from Syntauri and Passport Designs. The present software allows 1 to 4 oscillators per note (each with different waveforms, ADSRs, frequency offsets, and velocity-dependence), thereby giving a minimum of eight-note polyphony. But because there's no hardware dictation of oscillator grouping, short-lived oscillators can be dynamically re-allocated as needs require - the same principle that's used in the Synergy, in fact.

It seems that the way the PDSG is initially going to be used (in a commercial sense, anyway) is as the basis of a Computer Music System that revolves around the BBC Micro. No doubt that fact will be greeted with roars of delight from all those BBC Micro owners who've got past believing that SOUND and ENVELOPE statements are the passport to instant nirvana... In fact, the 'BBC Micro User' show, held in London at the beginning of December, saw the prototype of Clef's product doing its thing on the Watford Electronics stand under the able digital manipulation of its designer, Alan Boothman. Aside from the hardware that's doing the digital synthesis, the unit that was being earmarked for sale from the end of February will also include a 5-octave keyboard with programmable touch-sensitivity and, as a later option, the luxury of after-touch pressure sensing.

Software is still under development, but what was seen at the London show allowed the setting-up of oscillator parameters, assignment of multiple oscillators to each voice to create interesting timbral changes and/or chorusing and delay effects, programming of touch-sensitivity and keyboard splits, and some fairly basic real-time sequencing.

It would seem that Clef's main aim at the start is to provide an instrument with a good range of imitative sounds that really responds to the performer. In doing so, I suppose the Clef system is going somewhat against the grain of what many micro musicians are after (non-real-time input), but it is following on in the tradition of other eminently playable instruments like the Synergy and Chroma. What has to be remembered is that the Clef system will be selling for a fraction of the price of the above and, most importantly, is designed for interfacing with an extremely popular micro. That must mean that huge amounts of further software - non-real-time, educational, you name it - will follow suit. It deserves to do well.

And the price? Well, that hasn't exactly been finalised, but Clef are anticipating 'under £400 for a system', and that's inclusive of software to run it from the BBC Micro, probably the Apple II, and possibly certain other micros. The PDSG itself will in fact be appearing as a project in E&MM in a few issues time, and it's anticipated that it'll sell ready-made for around £150, but for more info on the system as a whole, contact Clef Products (Electronics) Ltd. at 44A Bramhall Lane South, Bramhall, Stockport SK7 1AH (tel: 061-439 3297).

ICMC '84

The International Computer Music Conference is described as 'the premier forum for exchange of the scientific, technical, and artistic aspects of computer music'. The 10th ICMC is being held in Paris from the 19-23 October 1984 at IRCAM and the Centre George Pompidou. The main topics of the conference include the following (quoting from the conference info sheet):

- 1 Processing and synthesis hardware, including VLSI design strategies.
- 2 Synthesis and compositional software, including real-time control.
- 3 Signal-processing, acoustics, and psychoacoustics.
- 4 Computer-assisted composition, research, and instruction.
- 5 Affordable systems based on microprocessors.
- 6 Aesthetic and theoretical implications of computer-based methodologies on composition and performance.

In addition, there'll be a healthy proportion of concerts, including a performance of Boulez's 'Repons' by the Ensemble Contemporain on the first day of the conference, two live concerts each day, and tape playbacks throughout the conference. Interested parties are invited to submit tapes, papers, and pieces for tape and/or live electronics and instruments. In case you're worried about the limitations of your 'O' level French, you'll be glad to hear that simultaneous translations in both French and English will be provided!

Unfortunately, there's a registration fee involved in attending the conference. If you're not a student, this is 600F (around £50); if you are, it comes down to 300F. On top of that, there's accommodation to be considered (prices start at around 275F per night for a single room in a two-star hotel). For more information and/or a registration form, write to Mrs. Danielle Guichard, Via Voyages/Congress Department, 9 Boulevard Malesherbes, F-75008 Paris, France. By the way, registration forms need to be sent in by the end of March, scores and performance tapes before February 1, and papers and tape pieces by May 1. So now's your chance to chat with the luminaries of the computer music world and see whether IRCAM is really all that it's cut out to be! Here's to a strong British presence at ICMC '84...

(Apologies for the jingoistic spirit that's crept in this month, but that's what comes of writing the column on New Year's Eve!)

USER FEEDBACK

This column offers readers the opportunity of standing on the soapbox and airing their views on micros and music. This month, John Yau, a third-year student at Heriot-Watt University, casts a few aspersions on the musicality of micros and their manufacturers, and talks about the hardware projects that he's developing around the BBC Micro. We've invited him to submit this to *Computer Musician* as a possible project, so watch this space...

“As well as having a personal interest in micro-based music, I am currently developing a BBC Micro music synthesis system for my final year project at Heriot-Watt University. Electronic music and micros are both fast-moving growth areas in the consumer electronics industry in their own right, but when you put them together, you've got something which may well 'explode' within the next few years. With respect to the latter, I'm glad that there are mags like *E&MM* which keep us informed of the latest state-of-the-art developments.

I feel that there is a definite place for micros in music synthesis. Without being too specific at the moment, the keyword is 'control'. The present generation of micros are unsuitable for direct synthesis of waveforms because of limitations of speed. The key to the potential music capability of a micro lies with both its programmability and its hardware. The programmability offered by a microcomputer opens up tremendous possibilities for the micro musician, but contrary to what advertising copy says about a particular micro being capable of all the sounds of the orchestra, there's no micro that's adequate as a self-contained music synthesis system. So, hardware external to the computer has to be developed, and this requirement falls hard on the average micro owner.

The average consumer believes that with a suitable software package, perhaps the cassette with the gloriously glossy inlay on their local WH Smiths' shelf, he or she can relax to a little Bach or Vivaldi. Unfortunately, no matter how manufacturers boast about the number of channels and octaves, the sound chips used in current micros are not well suited to music. They were designed with game sound-effects in mind and lack timbre variation and frequency and

amplitude resolution. In addition to that, the sound chip is often sited in a sea of high-speed digital signals which doesn't help the S/N ratio much – unless you want to compose 'The Breakfast Baroque Plus Frying Eggs'...

The BBC Micro has done well in overcoming the limitations of its sound chip by utilising routines in the Operating System to generate software ADSR envelopes. But with only 16 levels of amplitude available, it's a rather bumpy ride for slow attacks and decays. On top of the unremitting square waves, the 10-bit frequency resolution is the final blow – as frequency increases, the tuning ranges from bad (for the tone deaf) to AARGH!

Despite their inherent limitations, these sound chips still have uses if you're interested in the educational side of things. However, a line has to be drawn between the serious music punters (those who normally play instruments, etc.) and people like little Johnny and Dad, who marvel at the rendition of 'Greensleeves' buzzing out from their latest purchase. Unfortunately, and perhaps understandably, the micro manufacturers (and most reviewers) don't seem to recognise this line. As a result, it is difficult for the layman to distinguish between genuine claims and pure sales hype.

BBC Hardware

As I mentioned earlier, the real value of the micro is its programmability for controlling external hardware. At the moment, hardware add-ons are the inevitable way out for the more serious musician. After all, you don't buy a £400 BBC Micro to listen to some square waves coming out of a thimble-sized speaker. I know the expense of add-ons makes them forbidden territory for many

readers, but I'm sure that manufacturers will produce kits or even finished items to ease the financial burden in time.

To illustrate my ideas on this front, let me describe the system I'm working on. The system currently under development comprises the following hardware:

- 1 A percussion board connected to the user port of the BBC Micro.
- 2 Four 8253s and an 8255 interfaced to the 1 MHz bus provide 6 voices (2 oscillators per voice). The voices also have a suboctave to give the same sort of sound as in string synths and organs. An arrangement with the 8255 similar to the OMDAC generates the trigger voltages. Dynamics are possible since the volume of a note depends on the size of the trigger voltage. The tones go to an envelope generator and filter board (again, just like organs and string synths). We therefore have a 6-voice string synth interfaced to the BBC Micro, but as the filter voicing is under the micro's control, real-time processing is possible.
- 3 A single digital voice card, again under complete control of the BBC Micro. The card uses conventional TTL, so the chip count is high (18). The 2K x 8 CMOS RAMs can be addressed by the micro so that waveform tables can be filled. The static waveform then goes to a CEM 3372 (3 VCAs, 1 VCF), which is controlled from the remaining channels of the OMDAC-like configuration. In effect, this gives us a hybrid synthesiser, with all its parameters under micro control. The RAM address lines address two separate 2K RAMs, which go through separate 8-bit DACs, and then to two of the CEM 3372 VCAs. The idea is that with a clever bit of software the CVs for the VCAs can be made to pan during a note in such a way that the timbre will consist of smooth sequencing through 16 waveform tables. On top of that, there's also the possibility of VCF sweeping and so on.

Software

Of course, all the above hardware will be useless without software. The software I'm working on at the moment is in the form of an interrupt-driven interpreter, using the two VIAs on the BBC, which takes its code from an MCL sort of file. The main emphasis is on a non-real-time system, but sufficient provision is made for the (inevitable) possibility of extending it to a real-time system with keyboard.

I chose to utilise non-real-time because I want to have a system which does not have the glaring faults of many commercial products. For instance, the whole idea behind using a micro is its power in control and programmability, yet systems like the Compu-Music, Mountain Computer Music System, and Apple Chroma software do not allow you to program in repeats, macros, *del capo*, *del signe el fine*, and so on. The ultimate aim of the software is primarily as an accompaniment score machine, providing bass, chords, arpeggios, and polyphonic sequencing, not to mention the drums. Its other potential use is to play a complete musical score with a distinct improvement over the performance of the standard sound chip.

As you can see, it is a very elaborate system. The hardware costs may be quite high (£200), but this sort of modular project can be broken down. In fact, the drum board could be knocked up for just £10, allowing you and the Beeb access to drum scores that only the most sophisticated drum machines can produce. Alternatively, an analogue synthesist may be more interested in exploring digital synthesis with the digital sound card.

Studio Scene:

University Of Surrey
Electro-Acoustic
Music Studio



One of the studios used by Tonmeister students.

The University of Surrey has achieved some degree of notoriety on account of its extremely adventurous 'Tonmeister' course, a 3-year degree course that turns fledgling musical and technical talent into fully-rounded, musically-literate recording engineers (or, as the German has it, 'Tonmeisters'). So, it's not surprising to find that the Music Department has two well-equipped studios in which students are instructed in the gentle art of persuading magnetic particles to align themselves in more or less musical ways. However, there's also an expanding Electro-Acoustic Music Studio run by Robin Maconle, a lecturer in the Department of Music, and it's this that's our port of call in Studio Scene this month.

Lists of equipment are always of some interest – if only for oggle value – but in the Electro-Acoustic Music Studio's case, it clearly reflects the trends afoot in the outside world:

Digital: 2 Apple IIs, Alf music boards, Mountain Computer MusicSystem, and Soundchaser keyboard with Turbo-Traks 16-track software.

Analogue: VCS3, Synthi AKS, random voltage generator, pitch-to-voltage converter, 8-octave filter bank, Coloursound 8-way filter bank, Powertran vocoder.

Ambisonics: Calrec Soundfield microphone and control unit, Audio & Design Ambisonic Transcoder/UHJ encoder, Minim AD-2 Ambisonic decoder.

Recording: Sony SL-F1 VCR/PCM-F1 digital audio processor, Ferrograph Studio 8, Teac A3340, NEAL cassette-recorder.

Armed with this list, plus some knowledge of Robin Maconie's interests (courtesy of his book on Stockhausen and a co-authored article in *New Scientist* on computer composition), I spent an enjoyable

afternoon on the University's campus in Guildford talking about micros and their musical applications in an educational context...

An Apple for the Teacher

If a student is studying here, when would he or she get introduced to the Apple-based systems you've got here?

Well, there are formal lessons in the second year for both the music and Tonmeister students, the options being either straight programming using the Alf cards or the Soundchaser, or using the systems as an aid to composition. In their second year, the Tonmeister students go away for their industrial year, but I have them again for a special course in the third year called 'electro-acoustic music', during which they can do projects of an imaginative kind in digital synthesis or whatever. Some of the new lot of students coming back this year will probably gravitate towards electro-acoustics, and especially into the building of some sort of interface for the Apple or a more powerful system.

By 'interface', do you mean an alternative means of entering music?

Yes. The problem at the moment is that there's quite a lot of hack work involved in coming to terms with the equipment. I mean, it seems a pity that you have to fuss around with the Apple keyboard or the game paddles in order to enter notes. Also, there are disadvantages to a piano-type keyboard, in that you start thinking in terms of the piano, and that can be the kiss of death. I'm sure there must be some sort of modified interface between the composer and computer that would enable the positive

virtues of the microprocessor to be utilised by the composer without the disadvantage of having to approach it through an alien sort of technology.

Do you find that students take easily to these Apple systems?

I've found that those who aren't mathematical, but are keen to do composition, can come to terms with something like the Alf's Entry program very quickly. Because of that, it's a good entry for them to the microprocessor world and, thanks to the sub-routine facility in the Alf program, they can experiment with reprises and ostinato patterns. In fact, some of them have produced quite spirited Steve Reich-type pieces as a result. The third way we use the Apple is for analysis. I get all the students to take some pieces of classical music – a Bach *Invention* or Stravinsky's *3 Pieces for String Quartet*, for instance – which can be written out as a series of subroutines which reprise at different time intervals. The mere act of writing out these pieces, using the Entry software, is a straightforward and practical way of analysing music. Once they've done that, we move on to envelopes, timbre, and so on.

What about programming itself – how many students come onto the course with prior computing knowledge?

Well, more and more are, because we're now acquiring students at first-year level who've been introduced to micros at secondary school. We're talking about a development that's only taken place during the last two or three years, really. One or two students show a great deal of ability and, to be honest, I depend on the students for fresh ideas and their interests to take what I'm doing further.

Could you show me what you've been



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doing with the Alf card on the Apple?

Well, I'll tell you about the Canon program first of all. This was produced by a student at the request of Colin Gough, our external examiner at Birmingham University, who wanted a program to produce a canon that'd be very easy to use. In fact, it's got a lot of relatively sophisticated bits and pieces, including the ability to program a melody in major and then convert it to minor or pentatonic. A couple of other good things about it are that you hear the melody as it's entered and you get a visual display of the notes when they're playing. Of course, the real limitation of the Alf cards is that they only produce square waves, but I've done some work with them using a technique that Stockhausen used in *Kontakte* – that of speeding-up melodies to create unusual sounds. For instance, here's *Footsteps*, which creates the effect of footsteps in gravel...

Very realistic! How did you get that effect?

By trial and error, really. If I slow it down, you'll be able to see that it's actually just a tune, played with a shortish envelope, speeded-up so that the pitches lose their individuality and turn into a different sort of sound. Another effect is *Windsurge*, which produces a surging sort of noise that gradually forces its way upwards. In fact, it was based on harmonic regions, so that it starts with a wobbling around a fundamental, then there's a shift up to the first harmonic, a wobble around the second, and so on. Then, when you speed it up, it turns into a random noise which sounds as if it's being blown through a tube.

I guess it's really like using a shift register to produce various flavours of noise. It's useful to know that square waves can be pushed a bit further!

Yes, and it shows that lively musical sounds can be produced by applied programming techniques despite hardware limitations. Obviously there's a hell of a long way to go, but it gives me a few crumbs of comfort! Of course, we're always interested to swap ideas with other people using this sort of equipment.

The Soundchaser

When did you get the Soundchaser?

We got the basic system in April, and then the Turbo-Traks software update a few months later. The big advantage of it over the Alf system is that you've got so much more control of timbral quality. For instance, it's difficult to define precise envelopes with the Alf but very easy with the Soundchaser. On top of that, you've got the ability to define the harmonic make-up of a sound very accurately.

What sort of things have you been doing with it?

Apart from its obvious use as a self-contained synthesis/recording set-up, we've also been using it for experimenting with composing programs. Of course, normally you're restricted to entering notes from the keyboard, but a student of mine, Alan Reekie, has developed a program called 'TMaker' that generates note files from whatever composing rules you feel like putting in the program. So, after the program has generated the file, you can give it to the Soundchaser to play it. For instance, there's one version of the program called 'TBaroque' that produces a three-part composition, with all three parts running at different speeds, and the two upper parts harmonised to the *cantus firmus*.

What sort of rules have you used to generate the two top parts?

I think what it does is to calculate a

random interval and then harmonise the other parts. Subsequent intervals then get chosen out of a limited range of options – a semitone or tone up or down, as I recall.

So you're not actually going beyond a sort of first order transition rules scheme, where note spinning doesn't take into account what notes came before?

Yes, I think this one is more entropic – you start from certainty and proceed towards uncertainty. This is only one example and the musical results tend to be a little turgid, but I've worked on other programs. For instance, there's one called 'Maverick', which has a much freer sort of melody composition. One of the very provocative things about working in this field is that you learn that you can produce music which is more primitive or more avant-garde simply by stretching or compressing the same rules.

This way, you have a basis for evaluating melody which has nothing to do with culture – it's entirely to do with numbers. The upshot of this is that you start hearing a Bach *Invention* in terms of parameters that you probably weren't aware of before. Similarly, when you hear *Xenakis*, you realise that this is in fact very primitive music, though spreading it over five octaves rather than one turns it into something that appears avant-garde. Of course, to be able to demonstrate the continuity between one form of melody and another is a new or a renewed way of approaching music. Renewed because I think that some of the medieval composers were on the ball with this – the renaissance composers, for instance, who one thinks of as not as sophisticated as our equal-temperament stuff. In fact, it has a kind of elegance and precision which we can associate with the architecture of the time.

Sensible Synthesis

And, of course, elegance and precision is what you need when working with micros.

Yes, but one of the difficulties that has been facing computer music up to now is that its energy seems to be split between developing synthesiser techniques – experimenting with timbres and so on – and the mathematics of music; getting a computer to analyse a piece of music and reproduce the style. So there's a polarization of effort – some people see this equipment as a means of arriving at orthodox effects in a different sort of way and possibly want to make a million out of it, whilst others are fascinated by the philosophical or mathematical implications of it. It seems to me that trying to do digital synthesis simply on the basis of waveform construction is a grave defect, and the only argument for it is that it's cheap and easy, not that it tells you anything. It seems an illiterate way of going about things. In fact, I'm for going back to the way normal acoustic instruments are built.

But doesn't the modelling of acoustic instruments imply preconceived notions about sound synthesis?

I don't think so. It's been shown that the violin can be built by a person with no more than a piece of knotted string. He can derive all the dimensions of a Cremona violin. These instruments were built by people with ears but with very little literacy. They realised that production of beautiful sounds was the outcome of a series of procedures – a matter of getting everything right, including the grain of the wood, the age of the wood, the strings, the tension, the varnish, and so on – but the separate bits cooperated to produce a total effect that was very satisfying and beautiful. I think it

should be like that with a machine – the better it's put together, the better the whole.

Yes, I see that, but by starting with the digital equivalent of a vibrating string or whatever, aren't you still really pre-defining the sound in the same way as using a VCO or a noise source in an analogue synthesiser?

Perhaps, but what I would like to see is the computational facility of a computer applied to modifying a data string rather than originating a data string. I simply assume this is more efficient because it doesn't require an exact model to be followed at any one point. So, what I'd like to see is a system that's designed to deal with sound synthesis as an organic procedure, rather than as a perfect sound reproduction system derived from racing through waveform number tables.

I suppose the nearest we're getting to producing your sort of 'organic' instrument with present technology is by means of FM synthesis and non-linear distortion techniques, where very realistic sounds are produced with comparatively little effort. In fact, judging by the new Yamaha breed of machines, it would appear that the ear does seem to be fooled pretty convincingly.

Well, to be honest, I've never been convinced by the examples I've heard of Chowning-type FM synthesis, and it seems to me that the sorts of people who argue that the ear is easily fooled are themselves easily fooled. There's a difference between achieving a manageable compromise with equipment that's obviously a compromise and understanding just how much precision you need to compute a convincing instrumental sound. No computer-synthesised tubular bell sounds like a real tubular bell because the real thing swings this way and that, which adds a whole different dimension to it. And instantly you hear that, you know what a real bell sounds like. The funny thing is that the better your illusion of a real sound is, the more boring it is to people because they don't hear any difference. It seems to me that we should be aiming for a radically different approach to the business of synthesising sounds, because the old-fashioned approach is dictated by economic or business concerns, rather than with an idea of coming to grips with the real nature of sound.

Ambisonics

Aside from the pros and cons of different methods of digital synthesis, I gather that you're also keen to put sounds in their own spatial perspective.

Yes, a very clear long-term objective of mine is to include ambient projection of a sound in the organic process I've been describing. So, one should be able to synthesise a sound in a series of stages, starting as a normal instrument does, with the vibration of a reed, string, or air column, modify that by giving it the resonant characteristics of a tube or box, and then split it four ways, assigning each of the four split signals to a separate EQ unit. In that way, you should be able to impose a kind of 3-dimensional radiation characteristic which is at least approximate to the real instrument.

Surely there's more that can be done with just two channels? The Zuccarelli approach, for instance.

Well, a student of ours went over to Italy to interview Zuccarelli before he came over here, and she was bowled over by it. I must say that the demonstration I heard at the AES exposition in March, from the Italians he left behind – the imitation Zuccarelli, if you like – gave the impression of exaggerated height and depth, but very little



Robin Maconie with the Soundchaser.

front, back, and sideways. Actually, there was a paper in a very recent *AES Journal* which suggested that you can get a very good wrap-around effect with just two channels, but only as far as 270 degrees — you're still left with a quadrant that needs a third speaker. However, until you can produce laser holographic images which are complementary to ambisonic music, I think you're going to have difficulty getting your average consumer to bother with 3-D sound, as it were.

You've been doing some of your own ambisonic experiments, haven't you?

Yes, using those *Kontakte*-like effects produced with the Alf cards, we did a montage of effects, re-recorded them in a hall using the nearest equivalent we could make to a Soundfield mic, encoded it into a UHJ 2-channel format, and then played it back over 4 channels in a big hall down at the end of the campus on the occasion of a sort of flower display. There were people walking around this, and the sounds were basically sorts of bird chirpings, water and

wind noises, and so on. If you like, it was muzak, but the sounds created an atmosphere that was noticed and appreciated by the audience. This seems to me a fair enough way of using the specialisation of sounds and creating new kinds of audiences. You've got to get them to accept it without complaining, without feeling that they're being asked to do something incredibly difficult. You won't find a more difficult audience than the women in the Flower Association of Surrey!

Future Prospects

I want to build on the tremendous interest in this technology that now exists within the University and the world at large. I'm working towards producing music which is electro-acoustic, computer-synthesised, or multi-media, but in a way that actively attracts an audience. Apart from the pure music side, there's the development of digital equipment for music production and recording. For instance, we're hoping to obtain a student project — a digital filter — that was produced for a higher degree in the engineering department. The chap who designed it seems to have made some important discoveries as regards the processing of audio signals in general. This sort of thing is an area we'd like to encourage. We don't have a research division as yet, but there's tremendous scope for it — especially if we can attract support for research scholarships in this field.

You must be in an excellent position to do that, given the on-campus presence of the Tonmeister course.

The Tonmeister course is a marvellous guarantee of sound recording knowledge, good ears, and good musical brains. It seems to me that we've got to look into

the education of musicians more on the technical side. If we're going to make any progress, the last thing we want is a studio set-up which is really a kind of hobby room to which eccentric composer types are banished. It's my conviction that music should be central — as it was in medieval times — to the study of the Sciences. I think that music is a way of encoding number information in a way that allows relationships to be perceived in a form that's totally different in terms of rapidity and effectiveness. I believe that the challenge of electronic music, timbre synthesis, and so on, is of such importance that they'll lead to spin-offs just like the space programme.

And perhaps this will extend to primary and secondary school level...

Yes, indeed. But the great advantage of the microprocessor revolution is that music seems to be a part of that attraction, although it's at a very rudimentary level. Children are now able to get playing with electronic music in their own homes. What we need to do is to develop a teaching programme that will relate to what these children discover in a sensible and coherent way. I think we're at a very interesting time, because, after a period of very rapid expansion, there's a levelling-off of technology. I mean, we've got digital recording, which represents a plateau of quality, and similarly ambisonics. So, rather than having to keep up with constantly changing technology, which has been the fate of computer music up until the present time, and electronic music, too, we now have a stage where we can look forward to a period of relative stability. It's like the typewriter reaching a certain level of reliability, and then, over the next twenty years, developing its full importance and range of use.

David Ellis

CM

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Electronic Drums

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Spotlight on Mainframe

Mainframe consists of John Molloy and Murray Munro, a duo with a penchant for applying their imagination in many directions other than the simply musical. Whilst Chris Sievey and Pete Shelley made much media space out of their respective claims of being the first rock artists to put computer programs on vinyl, Mainframe actually got there first with their single, 'Talk to me', which included graphics programs on the 'B' side for Apple II, ZX81, Spectrum, and BBC Micro. They've now released an album, *Tenants of the Lattice-work*, which also looks set to achieve some sort of notoriety, on account of the fact that the record includes a competition with a first prize of an 18 carat gold 'M' worth £2,500! Also worth listening out for on the album is the Apple-based digital drum machine that they've had designed for them.

How did Mainframe come about?

JM: I answered an ad in Melody Maker to join a five-piece band that Murray was playing with in London.

MM: While we were recording demos for the band, we decided to do some of our own stuff as well. At the time, we were looking for a deal for the band, but PRT said they preferred the stuff that we'd done – they just thought that the particular material was better. So we thought we'd give it a go, just the two of us. That was about 18 months ago.

JM: As soon as we left the band, we started working on the story-line of our current album and wrote songs around it. And then, almost as soon as we'd started that, we got involved with a video company, Gothic Audio Visual, in Aldershot. We originally got involved to make a 3-minute pop video, miming to the song, but they then suggested extending it to the whole story, and that's what we did do – a 40-minute video. As we were working on the album, we thought we'd possibly have to get in other musicians to play the thing live, and then we decided at short notice, because there was an opportunity to do a concert last December, of actually trying to do the whole thing with just the two of us. So we left the bass-line and the drum track on tape and performed a version of the album with sections of the video that had already been shot.



Visuals

MM: From that time on, we decided that we were going to use visuals a lot – any video that we could get our hands on, computer graphics, and slides.

JM: A friend of ours, Colin Holgate, became involved in the project in order to write some graphics for the video, but he also ended up writing some graphics routines for the show. One of the other items of software that we used in our stage show was a graphics language from Vagabondo Software called 'CEEMAC'. It's an interesting bit of software in that the program is capable of filling in with improvisation if the user makes an error in entering the insertions. The program also looks at the cassette port, so there's a certain amount of syncing of the HIRES graphics screen to an external sound input.

A poor man's answer to programming laser graphics?

JM: That's right, it looks great with big screens. And there's also a package called 'Maestro', which puts all the graphics scores into one demo that can then be manipulated from the keyboard.

Was the name Mainframe part of a conscious desire to be a computer-based rock band?

JM: Yes, as we got involved in producing the video, having got Colin Involved in computer graphics, it was pretty clear that that was the direction we'd be going in.

MM: When we first started on the video, we were hoping to have a sort of animated Mainframe logo done on the Apple... This was done with Appleworld. We were hoping to fly around it, but after spending a day at it, we realised it wasn't going to work fast enough. In the end, Colin took individual pages of Images, and stripped them down with compression techniques to get better animation.

You both have Apples?

JM: Yes, and so have Colin and David Green, the guy who designed our drum machine. In fact, everybody who works with the band has now got a computer of some kind. That wasn't planned; it's just that as people have got more and more involved their interest in computers has developed. Even Graham, who's our sorter-out of everything, is using a BBC Micro as a word processor.

Apple Drums

Could you tell us something about the Apple-based digital drum machine?

JM: David came up with the drum machine just as we were about to do the final recording for the album. We then had a last-minute battle getting it into a state where we could use it for recording the album.

Up until that time, we'd used the Moog Liberation for various drum sounds and overdubbed real hi-hats and things. The first time we used the drum machine it didn't have any sequencing, so I had to tap in the sounds. But it still got over the problem of



the next step



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The rack can house a maximum of twelve modules. Each has two independent sound sources; the analog section which generates the classic "Simmons sound" and the digital section which is a recording of a real drum, stored in memory.

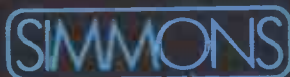
A variable level of either or both of these

sounds can be routed through a versatile group of filter controls, providing an incredible range from real drums, through the classic "Simmons sound" to outrageous percussive effects.

The "programmer pad" enables one hundred different "drum kits" to be compiled giving a total of twelve hundred user programmable sounds and a choice of sixteen of these pre-programmed "drum kits" can be recalled by striking the appropriate section of the "selector pad".

The newly designed drum pads feature a specially developed, "softened" playing surface, reaching new heights in dynamic control.

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Simmons Electronics Limited

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having the neighbours banging on the wall! And more importantly it produced a pretty good drum sound. We're intending to take the drum machine on the road, but not necessarily as a straight drum machine. Because of the sequencing facilities, we can write songs which involve vocal sequencing facilities, we can write songs which involve vocal sequencing of, say, chants, producing Fairlight-type sounds on the Apple. We know that it works and that it will work live.

MM: We've found that using the Teac is a very easy way of reproducing the backing tracks live – but it's also a bit too safe, so instead of using the Apple simply as a drum machine, we might use it as a sound-sampling sequencer and trigger vocal and other sounds from pads. We'll certainly be making a lot of use of the Apple sound-sampling on the next record we produce. Till now, we've had to struggle away getting our drum sounds manually, but once the drum machine came along, all this changed.

What appeals to you about sound-sampling?

JM: It's being able to take a sound you hear every day and actually produce rhythm from it.

We've been doing experiments with merging different sounds together so that a sound takes on a dual identity. Also, with Dave's waveform writer, you can draw a sound into memory and then listen to that, which is a lot of fun. You can actually create a sound which didn't exist before but which sounds acoustic. Well, almost!

MM: Also, the fact that you can repeat vocal sounds indefinitely means that it's easier to take risks. Normally, you'd have to make somebody do that, or decide to do that

yourself. To actually press a button to make it happen is so much easier than going into a studio with a microphone and making weird sounds.

'Stimmung' on an Apple! If someone came to you and said 'I can't afford an Apple, why should I buy one?' what would you say to convince them of its worth?

JM: The slots in the back! It's easier to build things for it, and also there's an awful lot of things available which involve sound in some way or another. Basically, because of those slots, you can do a hell of a lot with it – you're not just limited to a basic Apple, and you don't have to wait for somebody like Clive Sinclair to bring out the next piece of add-on before you have the slots.

We're going to be working on a more complex graphics machine, because the Apple, although it was fairly advanced when it came out, has now dropped way behind. Colin's experimenting with some graphics hardware, and Dave is looking at some other sound ideas. We're really aiming to push ahead with the use of micros on stage. I certainly don't know of anyone using the Apple on the stage in this way.

It's a shame that they and other micro manufacturers in this country are taking so long to see the value of what they term 'frivolous' computing applications...

JM: Well, it comes down to the fact that they can make more money selling a package like *Wordstar* on a basic CP/M machine than they can on music machines. That's unfortunate, but it's a fact of life. Still, there are some people doing interesting things. I think more and more bands will be using computers once they realise the potential of things like computer graphics on both live applications and on video.

Percussion

A lot of our music uses the mixing in and out of sound effects. And I think that's where we will go, having longer sound effects together with the sampling side of things. That will make that sort of thing a lot easier. But I think we tend to work along the percussion line rather than tonally, using those sorts of techniques for percussion rather than pitch.

MM: I'm interested to see how sound-sampling sequences of sounds other than drum sounds can be used in interpreting visual information. Up till now, there's been a whole range of film music, but I haven't heard much in the way of strange, new sounds trying to express visuals.

One point about using a micro is that you can use it to present, or audition, different sound combinations using some degree of machine selection – artificial intelligence, if you like – to actually design sounds that will be captivating to the ear.

JM: Well, we're working with fairly primitive machines. Compared to what's likely to come in the near future, the Apple is really very primitive.

The software on the single was a gimmick, but because we can't afford to take out four-page adverts, it seemed a good way of attracting attention. The point about our software is that it was interactive with the music, which we thought was much more important than simply displaying the lyrics. It was a piece of software we were actually using on stage and you could, in fact, turn the lights out and plug it in to your micro and see what was going on. If you like, it was a bit like going to see a Mainframe concert in your home, or, at least, the closest you could get to it.

David Ellis

CM



CAMI: Scaling Heights On The BBC Micro

This month, we move on to putting the sort of intervals encountered in the Pitch Tuner program (E&MM Sept 83) to work in a more obviously musical context, namely a program for teaching musical scales.

The Scales program randomly plays choices of 9 different scale types in all possible keys, ie. major, natural minor, harmonic minor, melodic minor, Dorian mode, whole tone, pentatonic, chromatic, and bagpipe. Bagpipe? Well, just for fun (and for keeping that old pitch acuity up to scratch), we've also included a few Scottish Highland bagpipe scales, which, in keeping with the instrument itself, isn't 100% in tune with the developments of Western music. In fact it's decidedly out-of-tune, as the C and F in this scale are about a quarter tone sharp! However, there is a somewhat less banal motive behind including this scale in the program. The Bagpipe scale is so obviously out-of-tune that even a tone-deaf student is sure to recognise it, which means that the student should get a pleasant bit of positive reinforcement every time Bagpipe re-appears, and that can only help to encourage the student in his or her scale recognition endeavours.

Though the inclusion of the natural minor scale is somewhat unconventional in the context of contemporary music education, we feel that the extensive use of this scale in jazz and rock music, and its derivation from the Ionian mode, warrants its inclusion. Some history on the evolution of scales might help at this point.

Scale History

The scales that we're all forced to practice till they're streaming from our fingertips like bath water have their beginnings in the 'church' modes that dominated European music for eleven hundred years. Thus, the Aeolian mode became our minor scale, and the Ionian mode, the major scale. It's amusing to reflect that, of the two modes that survived the test of time, the Ionian had been dubbed the 'wanton mode' (modus lascivus) on account of the way it secretly crept out of nunnerles and monasteries into the evil outside world of the 12th century! Though the Dorian mode is no longer an extant scale, we've also included it in Scales for the simple reasons that a) it was popular in plainsong and early harmonised music, b) much folk music is still modally based, and c) it represents a near relation to the natural minor scale in that its particular flavour is derived from a sharpened 6th step.

These modally — derived scales subsequently went through certain modifications to suit developing compositional styles. The harmonic minor scale arose from the need to make the transition from leading note (the 7th step of the scale — G in the case of A

minor) to key note more conclusive in a harmonic context. As a result, the leading note was sharpened (G sharp in the case of A minor), thereby forming the harmonic minor scale. Unfortunately, this change created problems for singers, because the interval between the 6th and 7th steps (a minor 3rd — F to G sharp in the case of A minor) was more characteristic of Middle Eastern music than Western music. The problem was solved by sharpening the F as well, producing a smoother melodic progression, this form being known as the melodic minor scale. However, this is done only on the ascending part of the scale, the natural minor being preserved for the descent.

Choosing a response is simply a matter of using the UP and DOWN cursor keys and pressing RETURN. If your response is judged to be in keeping with what was played, you'll receive a 'Right!' message and be moved on to the next scale; if incorrect, 'Wrong!' will appear and the scale will keep on playing until the correct response is delivered. By that ploy, the scalesperson is forced to learn the identity of scales however unsure he or she may be at the start. The ESCAPE key serves the same function as elsewhere in this chapter, and it can also get you out of an embarrassing confrontation with those bagpipes!

Workings

The main areas of interest in this program are those that play the scale and wait for the player's answer. However, 'areas' is a bit of a misnomer in that it implies things in more than one place. The point is that the program has to 'play' and 'wait' concurrently, since the scale plays on until an answer is received. A programmer without an understanding of the BBC Micro's sound queue system would probably use a loop which checked for a keypress before ending each sound request. This would work since the scale plays quite fast, but, in a general application where the sounds could be any duration, the delayed keyboard response would be very poor.

The easiest solution is to use a loop as before, but only send a sound request if there is room on the queue for it ie. if the operating system can handle it without making the program wait. That's the function of PROCplay between lines 710 and 830. The other side of the program is the choosing of scales and keys (line 350 onwards), with the character strings on lines 1100 to 1180 determining the steps of the various scales.

CM

From 'Creative Sound on the BBC Micro-computer' by David Ellis and Chris Jordan — to be published by Acornsoft in the autumn.

PROGRAM

```

>LIST
10REM Scales
20REM Creative Sound on the BBC Microcomputer
30REM Acornsoft (C) 1983
40
50DIMsc(8)
60$STRINGS(255,' ')
70dx=0:dy=7:ax=16:ay=5
80ENVELOPE1:1.0:0.0:1:1:1:126.-5.0.-3:126.90
90
10MDDE7
11OX=0
12$=CHR(80)+Scale Recognition.
13PRINTTAB(9,2)$:TAB(9,3)$
14PRINTTAB(0,dx):
15
16REM Read scale names and data
17FORscn=0TO8
18READa$:PRINTTAB(dx,dx+2*scn)a$
19READsc$(scn)
20NEXT
21
22ONERRORTO1280
23VDU23:10:32:0:0:0:0
24$FX=1
25$FX12=8
26$FX11=16
27cX=0:IPROCCur(0)
28
29REM Main loop
30ONERRORTO1200
31scoreX=0:scoreZ=0
32PRINTTAB(axX-4,ayX)SPC(16)
33REPEAT
34REM choose scale
35scnX=RND(9)-1:lx=X:rnd(12)-1
36:1a=Fmaxlet(sc$(scnX))
37
38noteX=0:dirX=1
39corX=FALSE
40
41REM answer loop
42REPEAT
43PROCplay
44
45REM look for input
46kX=INKEY(0)
47IFkX=-1:UNTIL0
48IFkX=13:IPROCCur(-cX<0):UNTIL0
49IFkX=13:IPROCCur(cX>0):UNTIL0
50IFkX<>13:UNTIL0
51corX=(cX=scoreZ)
52
53REM deal with answer
54IFcorX:GOTO590
55PRINTTAB(axX,ayX)'Right!'
56Z=INKEY(10)
57PRINTTAB(axX,ayX)'Wrong!'
58GOTO620
59SOUND1011,0,0,0
60PRINTTAB(axX,ayX)'Right!'
61scoreX=scoreX+1
62UNTILcorX
63
64
65Z=INKEY(50)
66PRINTTAB(axX,ayX)'
67UNTIL0
68
69REM play note if room on queue
70DEFPROCpaw
71IFADVAL(-6)=0:ENDPROC
72on=sc$(scnX)
73nchar=scr$(ASC'a'+noteX)
74pitchZ=INST(nchar)*kewX
75offX=0
76IFscnX=8AND(noteX=0RnoteX=3):offX=2
77IFscnX=3ANDdirX=-1AND(noteX=6ORnoteX=7):offX=-4
78SOUND1.1,pitchZ+offX,4
79IFnchar='a':dirX=1
80IFnchar='l':dirX=-1
81noteX=noteX+dirX
82ENDPROC
83
84REM find lexicographically
85REM maximum letter in string
86DEFNmaxlet(s)
87nlets='a'
88FORIX=1TOLENs
89nlet=MI$(s,IX,1)
90IFlet>nlet:nlet=nlet+s
91NEXT
92nlet+s
93
94REM adjust cursor posn. and print
95DEFPROCcur(dx)
96PRINTTAB(dx+20,dx+2*scnX)'
97cX=cX+dx
98PRINTTAB(dx+20,dx+2*scnX)'C'
99ENDPROC
100
101REM reverse string
102DEFRev(s)
103r=""
104FORIX=LENsTO1STEP-1
105r=r+s(MID$(s,IX,1))
106NEXT
107r=r
108
109DATAMajor,A B C D E F G H
110DATANatural Minor,A B C D E F G H
111DATAHarmonic Minor,A B C D E F G H
112DATAMelodic Minor,A B C D E F G H
113DATADorian Mode,A B C D E F G H
114DATAHolw Tone,A B C D E F G
115DATAPeratonic,A B C D E F
116DATAChromatic,ABCDEFGHIJ,K,L,M
117DATABagpipe,A B C D E F G H
118
119REM Error Handler
120ONERRORTO1280
121IFERR<>170:INKEY(-1):GOTO1280
122IFscoreX=0:GOTO300
123PRINTTAB(axX-4,ayX)'Score! 'scoreX:1000IVscoreX'
124ONERRORTO300
125AX=GET:GOTO300
126
127REM not escape
128ONERROROFF
129VDU23:10:672:0:0:0:0
130$FX=0
131$FX12=0
132REPORTPRINT' at line 'ERL' OK''

```

Concert Review

JOHN FOXX

After short but entertaining sets from two excellent support acts. Perfect Crime and Silent Running (both bands to watch out for), John Foxx took the stage at a packed Lyceum Ballroom on the last night of his first live tour since parting with Ultravox.

Spurning the use of backing tapes, Foxx has instead recruited an extremely competent four-piece band to perform his music, featuring guitarist Robin Simon (who played on earlier Ultravox albums as well as John's solo work), Zeus B. Held (!) on keyboards, probably better known for his production work with Fashion, plus an extremely tight rhythm section of bass and Simmons drums.

Kicking off with 'Running Across Thin Ice With Tigers' from Foxx's latest album, *The Golden Section*, the band sped effortlessly through a well-paced set, with John obviously more than happy to let the musicians concentrate on playing his material, leaving him free to spend much of the evening dancing and weaving across the stage, periodically producing a second microphone fed through a vocoder to produce his own rather eerie vocal backing. Only once did he venture over to the keyboards, to contribute a screaming synth solo to 'Like A Miracle'.

Understandably, much of the evening was devoted to material from *The Golden Section*, which features a more up-tempo, even 'poppy' approach than Foxx's previous offering *The Garden*, while still retaining many of the elements that characterise his work. Nevertheless, I couldn't help noticing what seems to me to be a lack of progression in the new material, much of which came over as little more than slightly up-market pop songs.

In fact, the major disappointment of the evening was the realisation that after the cold, mechanised sound of *Metamatic* and the serenity of *The Garden*, John Foxx is beginning to sound remarkably like Ultravox again!

Still, as far as the fans were con-

Lyceum
Ballroom.
London



cerned (and there were a lot of them) Mr. Foxx and friends could do no wrong, and as the set continued, taking in the excellent 'Twilight's Last Gleaming', probably my favourite amongst the new tracks, I certainly couldn't fault the sheer professionalism of the band.

There were a few surprises in store, too. Launching into a selection from *The Garden*, including 'Pater Noster' with its powerful choral sounds and the driving 'Systems Of Romance', John steered well clear of *Metamatic* material, even omitting 'Underpass' and 'No One Driving'. Instead, he punctuated the concert with compositions from his days with Ultravox, such as 'Just For A Moment' and 'The Quiet Men' (both from the *Systems Of Romance* LP), before ending the set with 'When I Was A Man, And You Were A Woman'.

Returning to tumultuous applause, John and the band encoored with yet another old Ultravox number, 'I Can't Stay Long', followed by the beautiful, haunting 'The Garden', complete with almost ghostly stage lighting and smoke effects.

After a little gentle persuasion, the last night audience was rewarded with a second encore in the shape of an extended version of 'Your Dress', during which John paused to thank the audience and various technicians for the success of the tour before praising his musicians as 'the best band I have ever played with'.

To summarise, apart from the weakness of some of the new material and to a lesser degree some aspects of Foxx's stage presence (the persistent gyrations did become rather irritating, smacking just a little too much of Bowie's Thin White Duke!), the concert was generally very enjoyable. On a technical level, the performance of the band was superb, and was backed up by an effective lighting system which was both powerful and yet restrained, plus probably the best PA I've heard at the Lyceum since Genesis played there in 1980.

Mark Wheeler

E&MM

High performance, low price kits for today's musicians

DIGITAL DELAY LINE



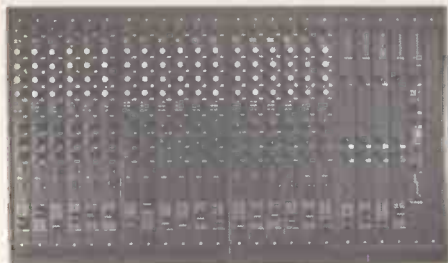
Digital delay circuitry is an absolute necessity for high quality studio work, but usually comes with a four-figure price tag.

Powertran can now offer you digital quality for the price of a high analog unit. The unit gives delay times from 1.6mSecs to 1.6 secs with many powerful effects including phasing, flanging, A.D.T., chorus, echo and vibrato. The basic kit is extended in 400mSec steps up to 1.6 seconds simply by adding more parts to the PCB.

Complete kit (400mS delay) **£130** Parts for extra 400mS delay (up to 3) **£9.50**

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This versatile mixer offers a maximum of 24 inputs, 4 outputs, and an auxiliary channel. Input channels have Mic/Line, variable gain, bass/treble, and middle frequency equaliser. Output channels have PPM displays and record/studio outputs. There are send/return jacks, auxiliary, pan and fader controls, and output and group switching. There is also a head-phone jack and built-in talk-back microphone.



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ETI single board synthesizer.



This professional quality 3-octave instrument is transposable 2 octaves up or down, giving an effective 7-octave range.

There is portamento pitch bending, VCO with shape and pitch modulation, VCF with high and low pass outputs and separate dynamic sweep control, noise generator and an ADSR envelope shaper. Other features include special circuitry with precision components to ensure tuning stability.

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2-channel, 100-watt amplifier



The SP2-200 uses two of the power amplifier sections of the MPA 200 (above), each with its own power supply. A custom designed toroidal transformer enables both channels to simultaneously deliver over 100W rms into 8 ohms. Each channel has its own volume control, and a sensitivity of 0.775mV (0dBm) makes this amplifier suitable for virtually all pre-amps or mixers.

Complete kit **£64.90**

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ETI 5-channel lighting effects system

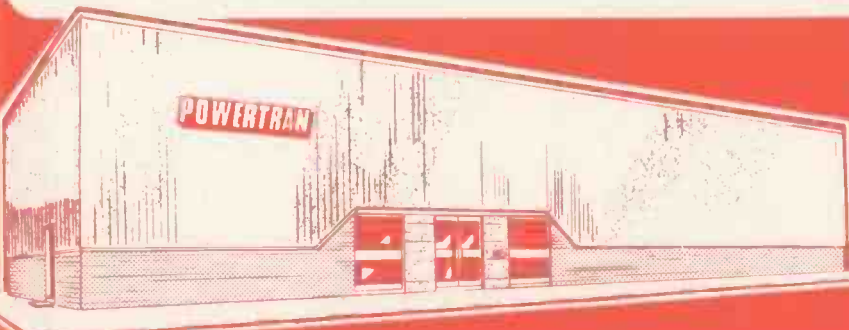


Many lighting control units are now available. Some perform switching and others modulation of light output according to musical input. The Chromattheque combines both functions. It controls 5 banks of lamps up to 500W each in either analog or digital mode. And the 5 channels give more colours and more exciting linear and random sequencing than is possible with 3 or 4-channel systems. Versatile light level controls enable the lights to be partially on to suit the mood of the occasion. Wiring is minimal and construction straightforward.

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Voltage-Controlled Clock for Analogue Sequencers

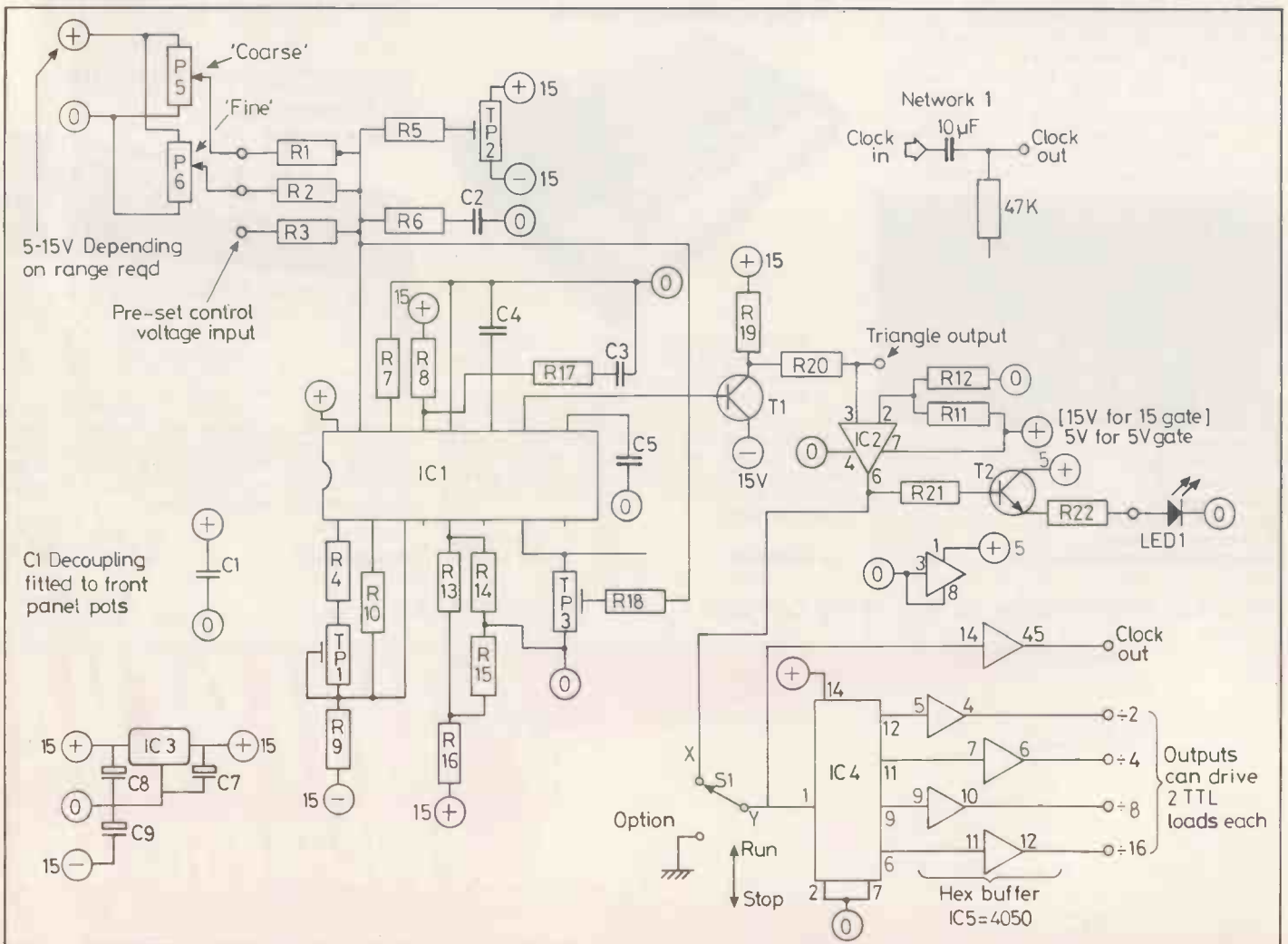
by Dr. W.J. Phillips

This article describes the construction and design of a voltage controlled clock which outputs a train of square waves at standard TTL level. It was designed to fulfil a need for my particular system which includes three Powertran 1024 digital sequencers, two

custom-built analogue sequencers, custom-built patch-board, programmable percussion machine and recently an Amdek programmable rhythm generator. However, there's no reason why the unit shouldn't work perfectly in other systems.

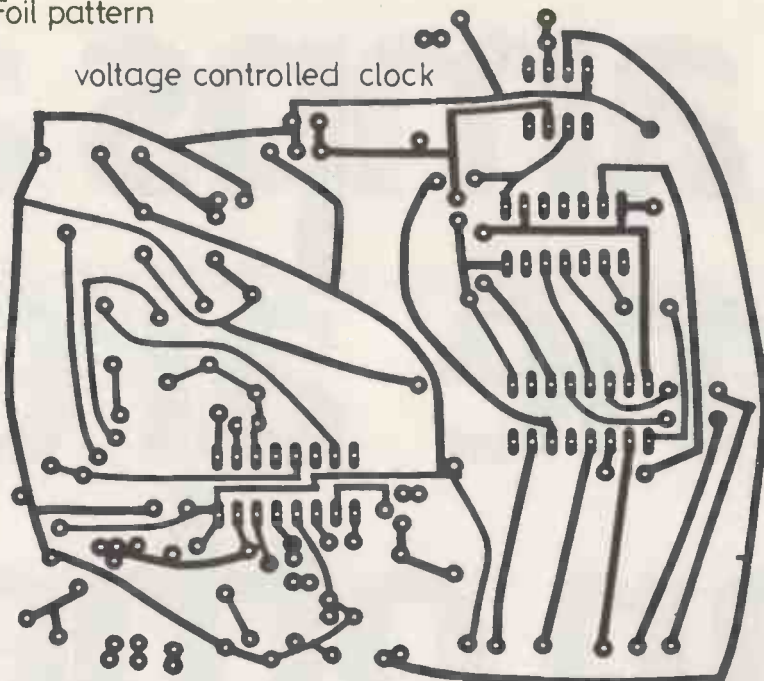
When performing live or in a studio it is convenient to be able to have sequencers and percussion generators running together in synchronisation. It is also convenient to be able to change the speed at which the units are clocked quickly and easily, preferably with a bank of presets. Accordingly it was decided to use a Voltage Controlled Oscillator as the heart of the circuit and the CEM3340 IC was chosen for this purpose. It's not the cheapest available but if the correct high stability components are used in the frequency-determined circuitry it is very stable and very reliable. If it's good enough for Sequential Circuits to use I felt it was good enough for me!

Since it's useful to have different modules running at different speeds, the VCO is followed by a divider circuit which divides the basic clock pulse down by five stages. The outputs are buffered and each output TTL can drive two standard TTL loads. The unit was originally configured on a 9" x 3" panel so that it could be incorporated within the scheme of the standard Digi-sound 'system 80' synth-



Foil pattern

voltage controlled clock

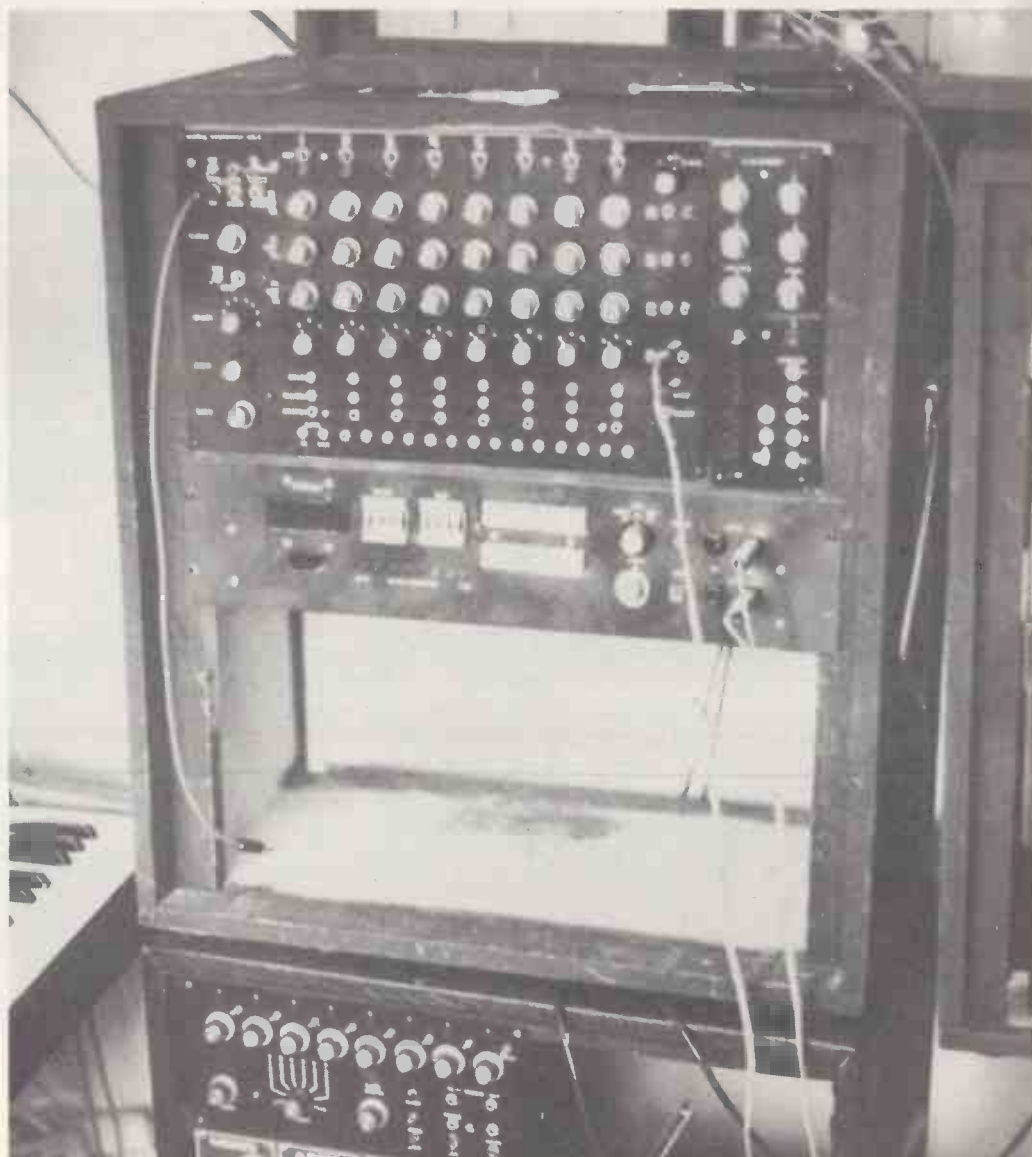


esiser. The Curtis chip produces square waves, triangles and sawtooths as standard and therefore when not being used as a voltage control clock this unit can be used as a voltage controlled low frequency oscillator.

Circuit Description

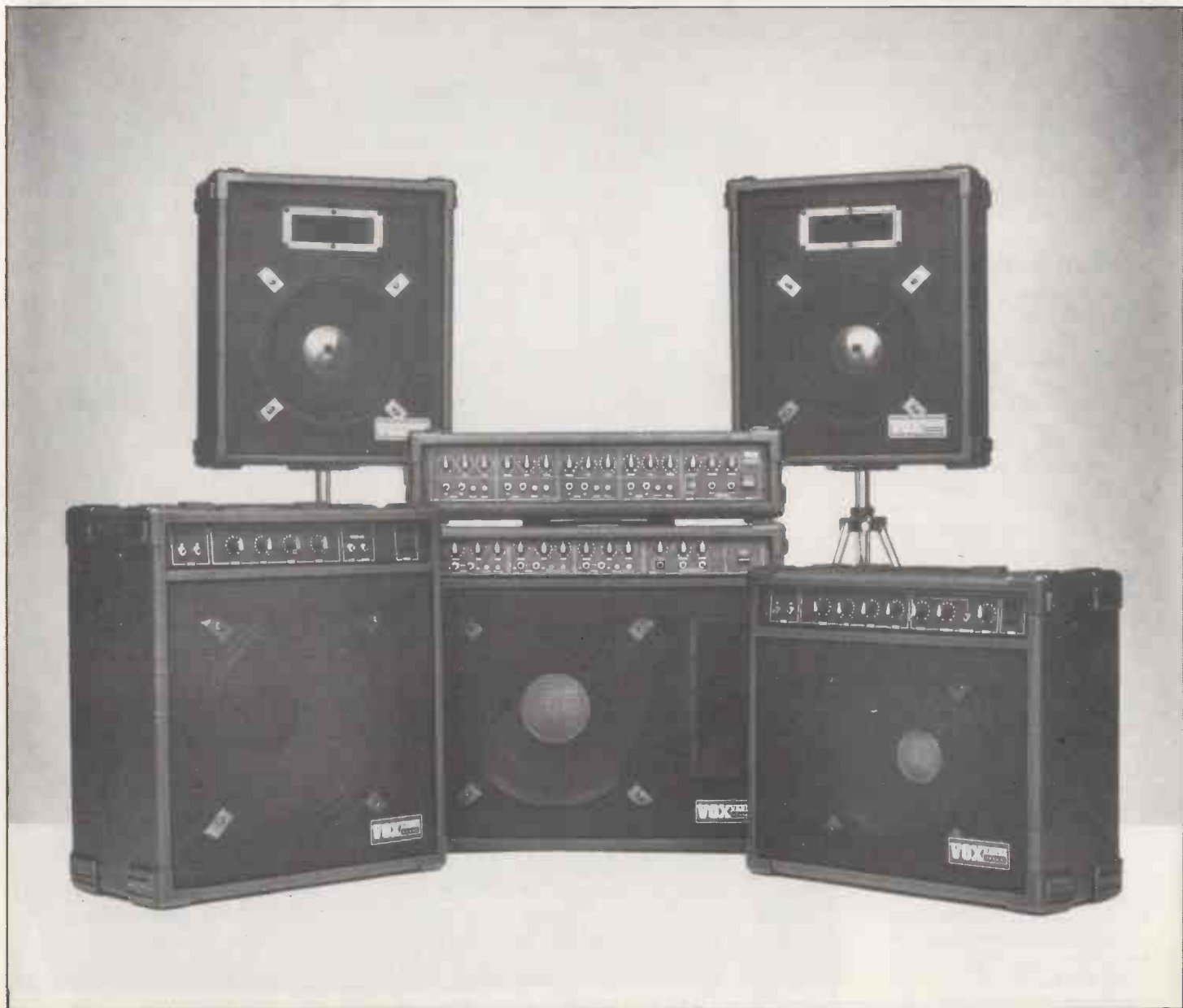
The heart of the unit is the CEM3340 voltage controlled oscillator. To understand how this works fully, the best thing to do is to get a CEM3340 data sheet from those awfully nice Digisound people. The frequency control voltage is injected into pin 15. The design allows for coarse and fine controls and also a preset mounted on the board, namely TP2 which sets the initial frequency with no other control voltage applied. Preset control voltages via R3 come from a variety of sources; in the prototype four 100K linear pots were mounted on the front panel and two jack sockets were provided for external control voltages. These were then selected by a six-way interlocking switch bank. A cheaper alternative would be to use a six-way rotary switch.

The facility to inject external control voltages means that the frequency of the clock can be controlled from a one octave per volt synthesiser keyboard or from



The VC Clock (top right) located within the author's modular synth rack.

**All amps are
some are m
than others.**



equal...but more equal

There are an awful lot of amplifiers on the market these days. Most of them look pretty similar and, especially on stage, tend to perform quite similarly.

So choosing the right equipment for you or your band can be awkward. Even a bit of a worry, when you're still in a position where every pound is hard-earned, and you don't have royalty cheques to burn.

But now the people who gave rock 'n' roll the Vox AC30 (still the classic amplifier) have made that choice a little easier. With the new Vox Venue Series of amplifiers and speakers.

As the name suggests, this new range has been specially designed and constructed to stand up to the rigours of life on the road. And to deliver the equally rugged sound that Vox enthusiasts know and love.

Yet, for all their high quality, Vox have managed to keep the prices of the Venue Series agreeably low.

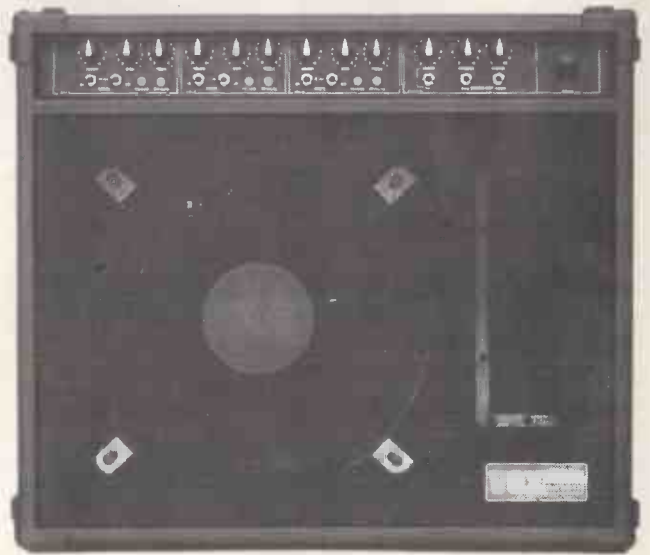
The **Venue lead amp**, for example, comes at an undistressing £199* (inc. VAT). For which you get 100 watts of solid power through a heavy duty 12" speaker; a three-band active eq., gain and master volume controls, and fully switchable overload and reverb, with LED indication.

The **Venue bass amp** will also push out 100 watts. In this case, through a 15" speaker, though still with three-band active eq., also with send and return for separate compressor or special effects units. All for £189*.

The **Venue 120 watt PA amp** lists for £199*, with a pair of powerful 150 watt PA columns available separately at £199*. The PA amp has four channels, each with 2 inputs and independent volume, bass and treble controls. And, like the keyboard amp, it has push-button selection for each channel for reverb and effects, plus presence, master volume and master reverb controls.



The **Venue keyboard amp** is specially developed to complement the high technology of today's keyboards. At £299* the specification includes three dual input channels, switchable reverb and effects send, plus 100 watts of power through a 15" speaker and H.F. horn with passive crossover.



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You can see what the Venue Series look like on these pages. But what really counts is what they sound like. So get down to your nearest Vox dealer and give them a try. We think you'll find they're a tough act to equal.

*All prices are suggested retail prices including VAT.

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VOX

a bank of digitally stored control voltages via a digital to analogue converter. Capacitor C4 is a frequency-determining component and should be a low-leakage type. The 3340 has temperature compensation incorporated into it through a very clever arrangement which the data sheets go into. This is an important factor in the design of a stable system

a hefty output for a CMOS device and should be adequate for most clocking arrangements. However, it would be possible to buffer these outputs further by means of CA3140 op-amps or transistor stages should this be required.

Moving further round the circuit we come to TP1 and TP3. In the prototype these were ten turned precision

type connector. It is important to observe the polarity of C7, 8, and 9.

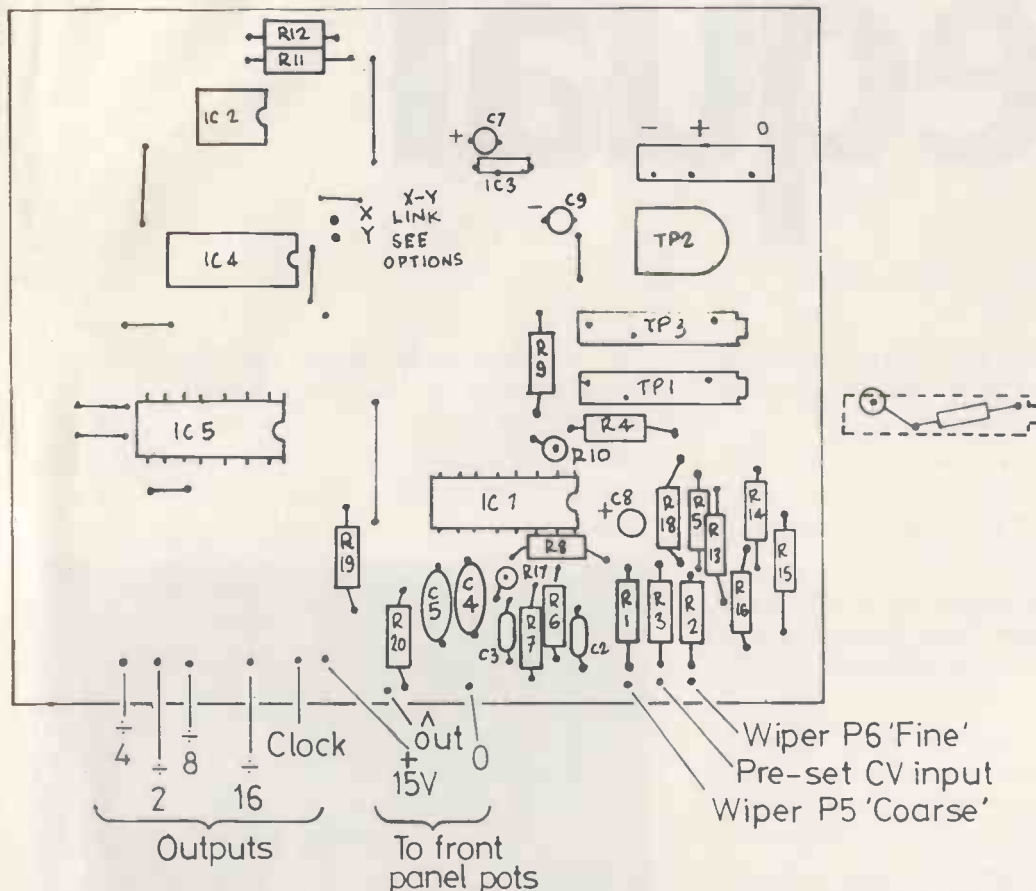
Various options are open to the user. Indication of clock-rate can be provided via a simple transistor driver and LED as shown on the circuit diagram. It can be useful to switch all of the clock outputs to a low state and this can be done by fitting switch S1. Should this option not be

required, a link is fitted between points X and Y on the PCB. The outputs of the clock are all TTL plus levels with 50% duty cycles. This may not be suitable for some applications and indeed was not found to be suitable for the Powertran sequencers.

For use with the Powertran sequencer it was found that the small circuit labelled Network 1 on the circuit diagram was necessary. Thereby the clock outputs were connected to a 10nF capacitor and a 47K resistor was connected across the output of this to earth potential. This gives a short spike pulse which triggers the Powertran unit satisfactorily. It was found that, despite what was said in the instructions, the Amdek RMK100 triggered quite satisfactorily from the unmodified clock outputs. However, this only occurs with my unit: I wouldn't like to take the consequences should any damage occur to anyone else's rhythm unit!

In other applications which require short pulses of precise duration, it would be possible to derive such a pulse from the use of Network 1 coupled with a 4047 CMOS monostable chip. One further modification that comes to mind is the inclusion of another control voltage input to allow a certain randomness to be introduced to the clock frequency, allowing a more human feel and less metronomic tempo.

E&MM



clock and perhaps one of the best reasons for using the Curtis chip. The triangle waveform is the one that we are concerned with and is taken from pin 10 and buffered by a BC212L transistor. It is important to use the right polarity of transistor otherwise the Curtis chip will become as hot as one of its deep-fried brethren and not be much use afterwards!

The square-wave is derived from the triangle by using IC2, which is a CA3140 op-amp, as a comparator. The common connection of R11 and pin 7 of IC2 is taken to positive 5 volts for a 5 volt gate or positive 15 volts for a 15 volt gate. However, since we are concerned with TTL levels the positive 5 volts is used in this application. IC4024 is a CMOS divider chip and the outputs of this are buffered by a Hex buffer IC5, a 4050 type. The outputs of this can each drive two TTL loads which is quite

cermets. TP1 is to set the octaves per volts relationship, ie. it is adjusted until a one volt control voltage applied via R3 increases the frequency output by a factor of 2. TP3 is provided to adjust the high-frequency range. In this particular application this degree of accuracy is not required and it is quite permissible to replace each of these trimmers by a couple of resistors of the value of equal to half the preset resistance. On-board 5 volt supply for IC2 4 and 5 is derived by IC3 at 78LO5.

Construction

This is quite straightforward. The usual CMOS handling procedures should be adopted for IC2, 4 and 5 and since IC1 is not a cheap component, observe handling precautions for this as well. Power supply can be connected to the board via a Digisound standard 'Chili'

VC Clock Parts List

- Resistors**
 1% metal film
 R1 - 150k
 R2 - 1M5
 R3 - 100k
 R4 - 24k
 R5 - 470k
 R7 - 1k8
 R10 - 5k6
 R18 - 1M
- 5% carbon film
 R6, R17 - 470R
 R8 - 1M5
 R9 - 910R
 R12, R13 - 100k
 R11, 14, 15, 16 - 47k
 R19 - 10k
 R20 - 22k
 R21 - 1k
 R22 - 220R
- Capacitors**
 C1 - 680uF polyester
 C2, C3 - 10uF polyester
 C4 - 10uF polycarbonate (must be low-leakage type)
 C5 - 100uF polyester
- C7 - 4u7 16v tantalum
 C8, C9 - 22uF 25v electric (mini)
- Semiconductors**
 IC1 - CEM 3340
 IC2 - CA 3140
 IC3 - 78LO5
 IC4 - CD 4024
 IC5 - CD 4050
 T1 - BC 212L
 T2 - BC 548
 LED1 - TIL 209 (or equivalent)
- Potentiometers**
 TP1, TP3 - 10k Cermet Multiturn
 TP2 - 1 Meg Cermet
- Notes:**
 (1) TP1, TP3 = Octave/Volt + HF Track
 These are fitted only if precise setting up of octaves/volt law and HF track are required. In normal use they can be replaced by 2 x 4K7/2 x 470K resistors.
 (2) R1, T2, R22, LED1 are a option *not* shown on PCB.

One thing that always leads to another.

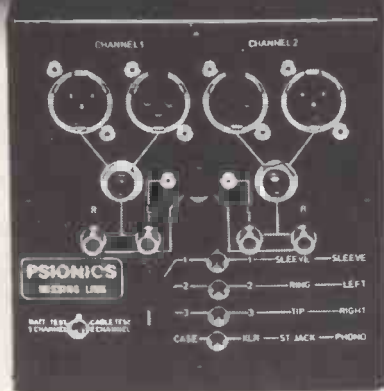
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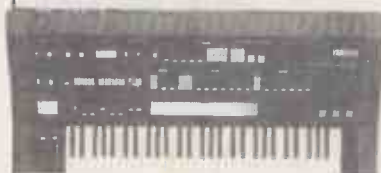
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- D Channel Switching for Effects and Reverb
- E Includes Cover, Leads and Footswitch
- F Attack Control

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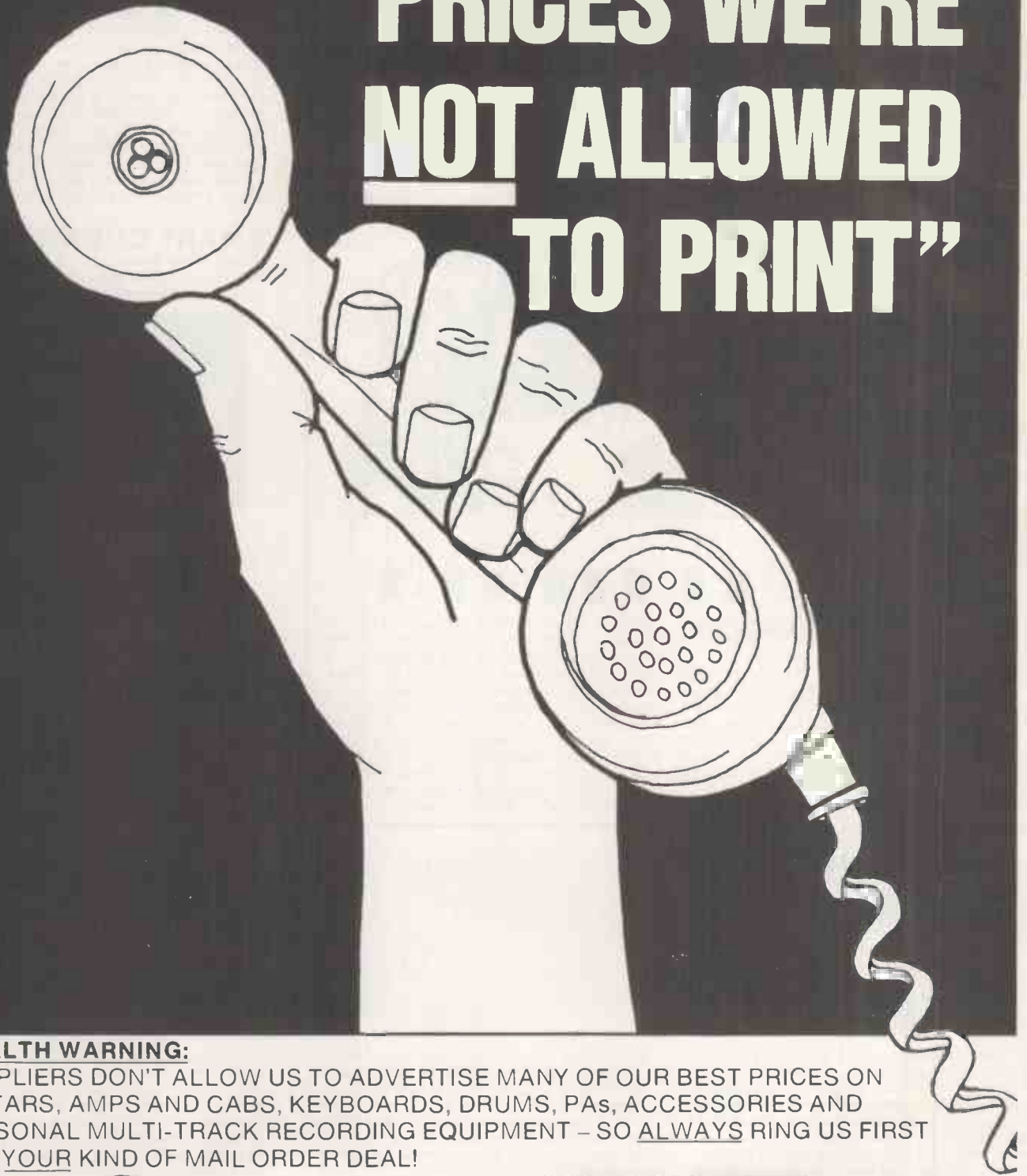
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CASSETTE REVIEW



SHOCK HEADED PETER:

(Esher, Surrey). Two Tracks. Nigel Hills, Korg Micro Preset, Casio 1000P, Tama Drums, electric guitar, Teac 244. Peter/Nigel hard at it again, and this time a much clearer effort than last (see Dec. E&MM). The first, title, track 'Call Me Shock Headed' ... opens with the extended drone common to the avant garde, but the addition later of the sequencer adds a depth to the whole piece that is refreshing. Certainly, for the equipment

used, this is quite exceptional. Again, the tracks are over long, or more precisely, the individual themes are squeezed dry. The stereo sound is good, and the cymbal sounds are particularly clear and well recorded. Reminiscent of early Floyd material, the dictation of the German fairy story mid track is fun, but wearing in the theme used. 'Amanda', the second track, is similarly ambient but with a better grip of the force required to carry a complex track. The addition of an echo machine would expand the overall sound greatly. Music: 7 Production: 6 Presentation: 5 Tape: 6

well honed and the homework has obviously been done on the songs – but there are some problems here. Not least the vocals that are not separate enough from track to track. The same could be said of the rhythm – the tempo here lacks any drive, a bit too slow for dance and a bit too energetic for listening. The bass sound is excellent, but it lacks a bass drum to add the continuity – easily rectified with any cheap drum machine. But, within the limitations – this is great! The atmosphere of the club comes across well, and the band play over that to effect. A real live recording in fact and one with feeling. Nice. Music: 7 Production: 3 Presentation: 3 Tape: 6

SMART COOKIES:

(Rayleigh, Essex). Three tracks. Flyo, vocals. Riff, guitar. Bobby, bass. The surprise of this band is that they are still at the level of sending out demo tapes to



the record companies. Their sound is full, rich, exciting and above all, professional. They have tried some strange things on this cassette, like the intro to 'Dream Targets' which sounds like a beaten acoustic guitar. Sub Simple Minds crossed with a drop of Ultravox is the order of the day for at least part of this offering, but 'Loud And Lonely' comes over as Beatleish, (and beautiful). Their use of the Drumulator is not overbearing, and they let their songs roar on of their own accord without taking too much away from them in terms of overproduction. Come on someone, sign them.

Music: 8 Production: 8 Presentation: 4 Tape: 8

RADIO LINKS:

(Blackpool). Two tracks. Gary Inskeep, vocals. Richard Banks, guitar. Dave Drury, Fender Jazz bass. Dennis Hill, Crumar Trilogy, electric piano. Brian Hall, Yamaha CS15, Casio CT1000. Bright, brash and breezy pair of tracks from this new band, who, if they can play this sort of thing live, they are on a winner. 'As The Ways Part', the first track, has a tremendous Bowie type vocal, which, coupled to a Roxy type backing (heightened by sax) adds up to a great MOR sound. Gary Inskeep has a powerful and versatile voice that is crystal clear. The track opens and closes with the sound of a radio tuning – nice touch that. Hard to think this was done on a 16 track – it sounds 24 or bigger. They have obviously taken the time to work out what they do best, and went and did it. The band are aided and abetted by Lew on sax, Azi on drums, and Rob on piano. These are from local band IN2XS. The studio was Park Lane, at Presnall near Blackpool, and the production was by Barry Lights – talented lad. All in all then, Radio Links have that sprinkle of magic dust over the work they do that sets them apart. About the only problem is that the hook lines, and the attendant links, are not quite strong enough – could be lyrics or just that quirk of production.

Music: 8 Production: 9 Presentation: 7 Tape: 8



It seems that Christmas gave everyone the time and energy to get a cassette recorded up for us – can't you stagger it – the postman is so annoyed ... The overall quality of both the songs and the production of the cassettes that we are getting is very much higher than normal – and at last some live tapes are coming in. Also, there are a few familiar faces here from bands and artists who have already been reviewed here. It was nice to see how they progressed. Keep the tapes coming to: E&MM Cassette Reviews, Alexander House, 1 Milton Road, Cambridge CB4 1UY. Keep on tracking ...

THE VISION FADES:

(Barnsley, Yorks). Ten Tracks. Christine Kula, vocals. Nick Alliot, Juno 6, Fender Rhodes, EP100 Echo, Drumatix. Martyn Waller, Tama Drums, Palste Cymbals. Steve Stables, Ibanez Bass. Patrick Walker, Custom Lead Guitar. Very promising commercial sound from Vision Fades, and the principal reasons are Christine's expressive

vocals and the great melody lines the band create. They've been together for just over a year, and this is their first offering, recorded in an 8 track studio. The constraints of the studio show through, but the effort is there. Perhaps a bit more time spent on the production of a few tracks rather than the generation of ten, would have paid dividends.

But, impressive nonetheless, and a sound that is clear, fresh, and unique – three elements that make for a pleasing rather than an exciting listen. Best tracks here are Small Hours, Oriental Images and No Not I. Could be a great singles band if the production was right.

Music: 7 Production: 6 Presentation: 5 Tape: 6

CHAPTER 29:

(Torquay). Five Tracks. Philip Andrews, Vocal/Guitar. Ian Churchward, guitar. David Clifford, Bass. Jeremy Brimcombe, keyboards. Shelley James, drums. Recorded live at Tapps nightclub, Sherborne. After the December 83 review of C29, its nice to hear their live performance. Again the tracks are

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Godwin Drummaker 32P	Feb
Wersimatic CX-1	Feb
Mattel Synsonics	Feb
Simmons SDS6 Drum Sequencer	Feb
Klone Kit	Feb
Movement Drum Computer 2	Feb
Korg KPR-77 Programmable M&A K-1/B Percussion Synthesiser	May
E-mu Drumulator	June
Music Percussion Computer	Aug
Tubby Drum System	Aug
Oberheim DX Drum Machine	Sept
MXR 185 Drum Computer	Oct
Klone Kit 2	Nov

Guitars

Westone Bass	Jan
Vigier Guitars	Feb
Tokai Flying V	March
Vox Standard Guitars	April
Ovation Cutaway Balladeer	June
Aria U60 Deluxe BBS	July
Yamaha SG200	Aug
Rickenbacker 360/12 String	Sept
Fender Elite Precision	Sept

Bass 1	Oct
Steinberger 6-string	Oct
Ibanez RS315SC	Nov

Amps

BGW 750C Amp	Jan
Tokai TA35 Amp	Feb
BGW 7000 Amp	March
Carlsbro Cobra 90 Keyboard Combo	May
Deanard VA-30K (Combo)	July
Fender 100W Stage Lead (Combo)	Aug
Rickenbacker TR75 GT Combo	Sept
Rockman IIb & Ultralight	Oct
HH K150 Keyboard Combo	Oct
Korg MM-25 Multi Monitor	Dec

Microphones

Pearl Phantom Powered Electrets	Feb
New Aria Range	March
Suzuki Dynamic Microphones	June
Milab P14C, DC96B	July
Calrec 600 Series	Oct

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Aiwa AD-WX110E Tape Recorder	April
Fostex X15 Multitracker	May
Clarion 4-track System	June
Cutec 4-track	June
Trident VFM Mixer	July
Korg KMX-8 Mixer	Nov

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Ibanez Pedals (Tube Screamer, Flanger, Chorus, Analog Delay, Sonic Distortion)	March
Eko Bass Pedals	April
Ursa Major 8X32 Digital Reverb	May
Korg SDD-300 Digital Delay	May
Ibanez DM 1000 Digital Delay	May
Evans SE-810 Super Echo	May
Fostex 3050 Digital Delay	May
Cutec CD-424 Digital Delay	May
DeltaLab Effectron ADM 64 Flanger/Doubler	May
Roland SDE-2000 Digital Delay	May
Yamaha R-1000 Digital Reverb	May
MXR Delay System II	May
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VestaFire Dual Flanger	June
Aria AD-05 Analog Delay	June
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Ibanez HD1000 Harmonics Delay	Nov
Carlsbro AD1 Echo	Dec

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Hohner Harmonica Pickup Systems	Oct
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Synblo	Jan
Transpozer (Pt 2)	Jan
Amdek Compressor	Jan
Synbal	Feb
Caltune	Feb
Amdek 6 into 2 Mixer	Feb
Shaper	March
842 Meter Bridge	March
Amdek Rhythm Machine Kit	March
Syntom II	April
Amdek Metronome Kit	April
MicroMIDI	May
Amdek Flanger Kit	May
Home Studio Active Speaker	May
Omdac	June
Amdek Power Distributer	June
Digital Signal Processing	July
Amdek Delay Kit	July
Tap Tempo	July
Amdek Phaser Kit	Aug
Synclap	Sept
Amdek Tuning Amp Kit	Sept
Mains Distribution Board	Oct
Amdek Graphic Equaliser	Oct
Software Envelope Generator	Nov
Valve Driver	Dec

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Richard Barbieri (Japan)	Jan
Patrick Moraz	Jan
Isao Tomita	Feb
The Human League	Feb
Klaus Schulze	March
Michael Karoli (Can)	March
Francis Monkman	March
Bernard Xolotl	March
Chris Franke	March
Naked Eyes	April
Gabor Presser	April
Keith Emerson	May
Steve Hillage	June
Arthur Brown	June
Larry Fast	June
Marillion	July
Hans Zimmer	July
Bill Nelson	Aug
Hubert Bognermayr	Aug
Barclay James Harvest	Aug
Peter John Vettese	Sept
John Miles	Oct
Andrew Powell	Oct
Tony Banks	Nov
John Foxx	Nov
Gary Numan	Dec
Psychic TV	Dec
Philip Glass	Dec
Steve Gray (on the DX7)	Dec

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Pt 3	July

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Inkeys Cassette Magazine	Dec

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Rudiger Lorenz	Aug
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Chord Symbols April

How To Write A Rock Song

Melodies March
Putting Words To Music April
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Form & Structure July
Arranging Sheet Music Sept

Guide To Electronic Music Techniques

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Advanced Music Synthesis

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Sample & Hold July
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Bill Nelson 'The Real Adventure' Aug

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LEDs, Usage & Abuse June
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Hot Wiring Your Guitar

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Don Larking March
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Simmons Electronics June
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MPC Electronics Dec

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Hands On Show Preview Nov
Home Entertainment Show Report Nov

America

Crate Combos, Fender Concert Series Amps, Pearl Mics, MXR Omni Feb
Korg Poly 61, Pearl Effects, Fender Bullet Guitars March
SCI Prophet 600 & T8, Korg Poly 61, Oberheim OB-8 April
Ripley Guitars, Peavey Guitars, Roland SH-101, Shure & Pearl mics May
Ibanez Roadstar II Guitars, Crumar Roadrunner 3, Buchla 406 Pianos June
Loudspeakers, Effects, Roland Compu-Music Jupiter-6, Cube Chorus, Guitars, Mixers Aug
Shure Mics, Electro-voice mixers & stage system, MXR effects Sept
Speakers, PA Systems, Effects Oct
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Macro Music – International Course

(Making Music on Mainframe Computers)
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Amdek Compu Music/Sharp Micro Feb
Rhythm Sequencer for MZ80K March

Sounding Out The Micro

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CAMI

Pitch Training on the BBC Micro Sept
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Chip Chat

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Music Composition Languages

Pt 1 Sept
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Oric-1 Micro Review March
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Which Micro? – Pt 1 Nov
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Decillionix DX-1 Digital Sound Effects System Dec

GENERAL REVIEWS

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Tangerine Dream, Hawkwind, Fashion. Jan
George Duke, Stanley Clarke, Pat Benatar, AMM. March
Helden, Laurie Anderson, Fad Gadget, The Enid. April
10CC, LGT, Mainframe, Boddy. May
Klaus Schulze & Rainer Bloss, Tim Souster. June
Steve Hackett, Bernard Szajner. July
David Bowie. Aug
Peter Gabriel. Sept
UK Electronica. Nov
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Daavid Allen Charly, Neu, Louls Clark, Whitesnake, John Lennon Collection. Jan
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Jean Philippe Rykiel, Neal Schon & Jan Hammer, Amon Duul II, Earthstar, Deluxe A, Nash the Slash, Fotostat, Thomas Leer. March

Gabor Presser, Robert Gori, John Watts, Duet Emmo. April
Pink Floyd, Data Opera, Uropa Lula, Rick Wakeman, Big Amongst Sheep, Helden. June
Rolf Trostel, Edgar Froese, Shoc Corridor, Eloy, Peyr, Peyr, Roy Finch, Martin Kershaw, Danielle Dax, Orchestral Manoeuvres, Dome, Kajagoogoo, Sex Gang Children. July
Peter Gabriel, Bill Nelson, Magnum. Aug
Asia, Duet Emmo, John Miles, Kate Bush, Kraftwerk. Sept
Mark Shreeve, Ian Boddy, Various Artists, Crozier & The Generator, Be-Bop Deluxe, Brian Eno, Philip Glass, Hubert Bognermayr, Gary Numan, New Order, Midge Ure/Mick Karn, Cabaret Voltaire. Oct
John Foxx, Red, Virginia Astley, Mainframe, Gang of Four, Depeche Mode, Heaven 17, The Wake, Herbie Hancock Nov
Yello, Helden, The Cure, Tangerine Dream, Eddie Jobson, Herbie Hancock, Greg Lake, Ray Manzarek, Ultravox. Dec

Videos

Grace Jones March
The Tubes, The Stranglers April
Video Rock Attack, Imagination in Concert May
Soft Cell, Human League June
Duran Duran, Japan July
Barclay James Harvest Aug

Books

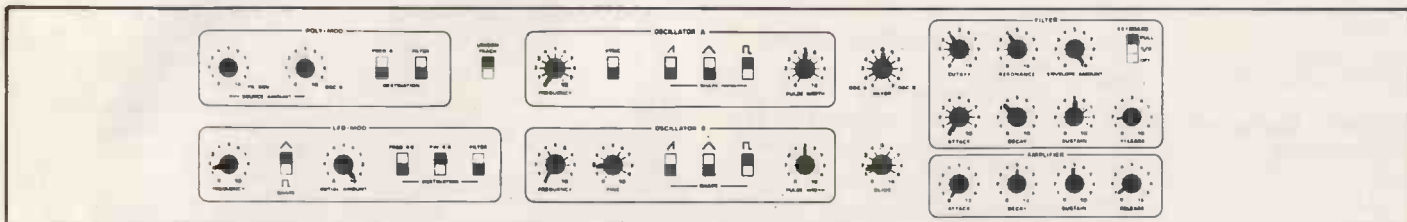
Southall Abbey Road Trowsdale & Turner Sharp Software Techniques Terrell & Simpson ZX81 User's Handbook. Jan
Bristow Synthesizers: An Easy Explanation; Schrader Introduction to Electro-Acoustic Music. Feb
Hartnell ZX Spectrum Explored
James Art of Programming the ZX Spectrum Albrecht TRS-80 Colour Basic
Penfold How to get your Electronic Projects Working
Penfold 30 Solderless Breadboard Projects Michaels International Diode Equivalent Guide Penfold Multi Circuit Board Projects. April
Sawyer Vibrations: Making Unorthodox Musical Instruments
Hammond The Musician & The Micro. June
Klein Electronic Music Circuits
McLein/Williams/Williams The ZX Spectrum Simpson ZX Spectrum User's Handbook. July
Steward Introducing the Dots. Aug

RR. PATCHWORK. PA

This month we are concentrating on bass sounds. This is an increasingly important area of the synth players 'vocabulary', especially in bands where there is no bass guitar player. Not only can it be tricky for a keyboard player to think 'bass-line', but satisfactory programming of a suitable sound can be very demanding. The reason for this is that when a sound is played in low register, virtually all the harmonics are in the audible frequencies (at higher registers the human ear cannot hear them), and so we can hear everything that is (or isn't) going on. You will all have noticed that a good sound taken down a few octaves can begin to sound thin and lacklustre. The reason for this is often that when the sound was programmed, the higher harmonics (then inaudible) were not catered for.

So how can we set about making our bass sounds more interesting? Firstly, if we want more high harmonic content, we can open up the filter, either manually (using the Filter Cut-off Frequency Control) or automatically (using the Filter Envelope Amount Control). Of course, this all dependant on there being some high harmonics to listen to. This will depend on the basic waveforms selected. The best two source waveforms to have on the oscillators are sawtooth (ramp) wave or a pulse width-modulated wave (PWM as it is often referred to). On some synths this is available automatically, but on most you will have to program it by routing a slow LFO triangle wave to the Pulse Width of both oscillators once Pulse (or Square if pulse is not available) has been selected.

Here is an example of a beefy bass sound on the Prophet 600 using this technique:



Note the other techniques that have been used to 'fatten' up the sound: the two oscillators have been slightly detuned (using the Fine control on Osc B) and Unison Track has been selected. This causes all 12 oscillators to play the note struck on the keyboard, which now works monophonically, single-triggering, low note priority (just like the Mini-Moog, which is still the standard bass-line synth for many people).

This patch also shows the usefulness of a 2ADSR synth. Here the Filter Envelope is being used to reduce the brightness (an effect exaggerated by the Resonance setting) more quickly than the volume (compare the two Decay settings), which gives the sound a more punchy percussion quality ideal for rhythmic patterns.

On this patch for the OB-8 by Oberheim demonstrator Todd McKinney, we can see some of the same techniques being used. Note the use of Page Two to bring in the LFO vibrato on oscillator 1 (Attack Mod 1 Control).

OB-8

PAGE 1 FUNCTIONS

"P Bass" by T.S. McKinney
 NOTES: VCO 2 up 5th

OB-8

PAGE 2 FUNCTIONS

PATCHWORK.PATCHWORK

Of course, this patch can be tried on any of the Oberheim polysynths (OB-X or OB-Xa) as well, because of their 'family' similarity, and the only thing that will change is that the LFO mod will not be delayed. Try setting up this mod on the right hand lever instead, and then introduce it yourself after you have played the note.

Finally this month, we have help for those of you who are still struggling to program your DX7s with those old synth sounds. Here is a bass sound by Martyn Phillips (you may remember him from Java, our tape of the month in September). This is a hard 'syne'-type bass sound which makes use of the touch sensitivity of the keyboard to modify the pitch.



Funk Bass for DX7

Source: Martyn Phillips

Parameter	Value	Parameter	Operator Numbers						Parameter	Value
			1	2	3	4	5	6		
Algorithm	8	Operator Freq.	1	5	1	5	1	4	Pitch Envelope	
Feedback	5	De-tune	0	45	0	0	0	0	Rate 1	NA
LFO Waveform	Triangle	Rate 1	99	99	99	99	99	4	Level 1	50
Speed	35	Level 1	99	99	99	99	99	93	Rate 2	NA
Delay	0	Rate 2	62	34	62	42	45	62	Level 2	50
TMD	0	Level 2	0	71	95	84	95	79	Rate 3	NA
AMD	0	Rate 3	23	0	23	7	0	60	Level 3	50
Key Sync.	Off	Level 3	84	53	84	0	0	0	Rate 4	NA
Pitch Mod. Sens.	3	Rate 4	58	0	58	40	0	55	Level 4	50
Amp. Mod. Sens.	0	Level 4	0	0	0	0	0	0	Keyboard transpose	C2
All Operators	Frequency (Ratio)	Break Point	NA	NA	NA	NA	NA	NA		
Key Sync.	On	Left Curve	NA	NA	NA	NA	NA	NA		
		Right Curve	NA	NA	NA	+ Lin	-Lin	NA		
		Left Depth	NA	NA	NA	0	0	NA		
		Right Depth	NA	NA	NA	12	20	NA		

For those of you who still don't understand what's going on here, don't despair. Martyn is preparing an article for next month's issue which examines programming techniques on the DX7 in greater depth. In the meantime, keep sending us your patches, so we can cover the largest range of synths and the widest variety of sounds.

E&MM

PATCHWORK.PATCHWORK.PATCHWORK.PATCHWORK.PATCHWORK.PATCHWORK.PATCHWORK.PATCHWORK.PATCHWORK.PATCHWORK

In this new feature we will be examining just how certain sounds can be created on particular synths. There are two reasons why we feel this to be useful. Firstly, no amount of in-depth synthesis theory, however thorough and well explained, can be applied completely to an individual make of synth. On modular systems it is perfectly possible to add more modules if your set-up doesn't cater for the required hardware (be it oscillators, filters or whatever) needed for a particular patch. But on a polysynth, if there is one oscillator too few or no filter envelope there is nothing you can do. So we have tied the patches down to particular synthesisers.

The second reason is that certain synths often have little peculiarities which can be made to do a particularly useful job in a certain sound and we will be endeavouring to highlight this where such idiosyncrasies exist.

We hope to use many sources to make this regular feature as widely reaching as possible, ranging from Factory presets and ideas from manufacturers, through sounds programmed by E&MM staff and regular contributors, to those submitted by you the reader. We also want to cover a wide range of synths be they brand new or old faithfuls. So if you have an unbelievable crumhorn patch for the DX-7, an authentic sax for the Wasp, or a sound no-one has ever heard before, send it through to us (in as comprehensible a form as possible) and mark your envelope 'Patchwork'. All sources will be credited, so here's your chance to appear alongside the big names!

As far as the patches are concerned, don't take them as gospel! Individual instruments of the same make and model number still vary from one to the next, so if the patch doesn't sound quite right, feel free to tweak the settings. No patch is unimprovable, however respected the source.

If you don't have access to the actual synth in any patch, this doesn't mean you can't try out this patch on a similar machine. As long as the basic format is the same, it should work. You never know it may actually sound better!

To set the ball rolling here is a look at how more authentic brass sounds can be created. We are beginning with a patch for the Poly 61 as the way this synth is programmed draws attention to every parameter and the role it plays in creating the final sound.

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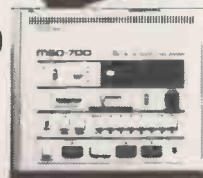
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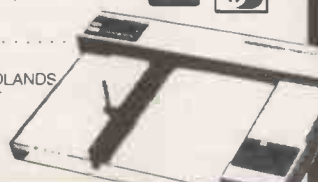
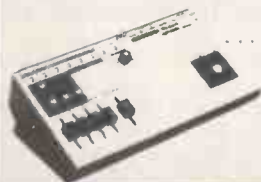
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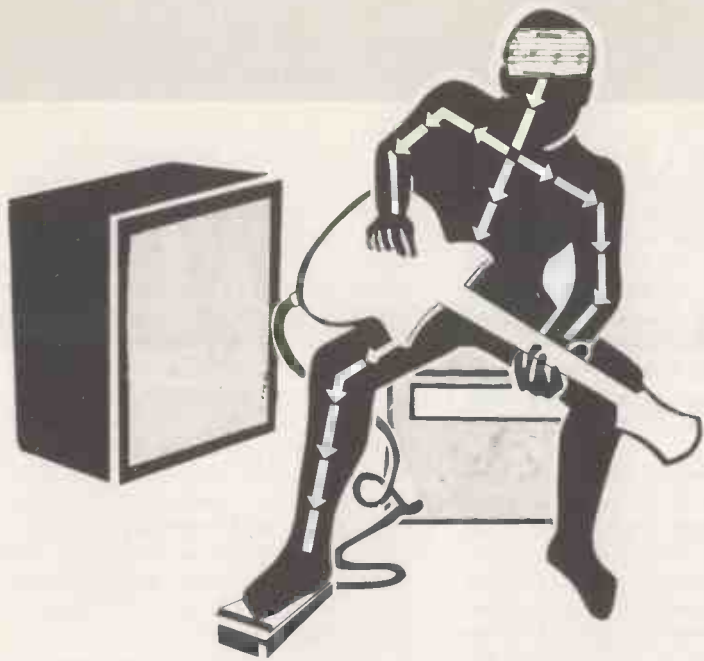


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MIND OVER MUSIC

Following on from our successful series 'The Psychology Of Music', we invited Ian Cross of the Centre for Arts and Related Studies at the City University, London, to submit an article introducing the science and its significance to the way in which we compose, play, perceive and understand the various different musics that currently exist.

Music is a complex, difficult-to-define phenomenon. Perhaps the best available definition of it is that music is whatever activity involving sound that a culture/community/subculture/elite/A&R man judges to be music. Such a definition is not as flippant as it may seem; globally, a wider range of musics than had ever been previously acknowledged to exist is simultaneously available. The questions to be asked in an attempt to comprehend all these musics have to be: Are there any factors common to all of them? And if there are, how can we best investigate and describe them?

Two instantly obvious factors are people and sound. Sound is measurable, and human physiology doesn't vary that much from culture to culture. So some investigation of how we hear and how we produce sound might give us a third common factor: the physiological constraints on what we can hear and what we can do to produce sound. Going further, the processes of human thought seem to share many common features across communities and cultures. So, joining together these human factors, our understanding of human perception, cognition (thought processes) and performance are of central importance in understanding our multiplicity of musics.

If we can listen to a sound purely as a sound, without necessarily associating it with an object producing it, we find few qualities of the sound as easy to describe as shape, size and colour are in seeing an object; when we see an object, we feel that we can see certain properties in it which are physically measurable. This doesn't seem to be the case with sound.

But what about pitch, or loudness? Well, pitch can be related roughly to the frequency of a sound, that is, the number of times the changes in direction of air pressure gradient which constitute the sound occur per second. What if the sound only lasts a millisecond? What if there's more than one frequency present in the sound? And, though loudness is related roughly to the amplitude of the changes in pressure constituting the sound, a low-frequency sound will seem softer than a mid-frequency sound of the same amplitude. Loudness also depends on context; a brick dropped in the hush after a solo violin concert just before the applause will obviously seem louder than a brick dropped in a hush (?) following Einstürzende Neubauten's farewell chord. So the relationship between what we hear and the physical correlates of what we hear is not particularly simple.

Many of these relationships have, however, been more or less worked out. We can now measure the frequencies and amplitudes present in a given sound, perform some calculations, and tell which pitch (if any) the sound is likely to be heard as having. Such knowledge is important and useful; unfortunately, it doesn't enable us to answer many questions about music. The reason for this is that most research aimed at finding out how we relate the subjective attributes of pitch and loudness to the physical attributes of frequency and amplitude uses a very small range of sounds in its experiments. The method used usually involves presenting a listener with two or three sounds at a time, varying the physical relationships between the

sounds and measuring the listener's responses to the changes in the physical, acoustic relationships (frequency etc.) between the sounds. This psychophysical or psychoacoustic approach to sound tells us how we hear, but doesn't tell us much about how we hear music, as almost all musics comprise more than just groups of two or three different sounds.

'Most musics can be said to consist of a balance between change and stasis.'

So another possible factor common to different musics must be considered: structure. Most musics can be said to consist of a balance between change and stasis; while one element (eg. rhythm) stays the same, a second (eg. pitch range) may change, and vice versa. Alternatively, all elements of a piece of music may change simultaneously, or all may stay constant. Leading on from this is the idea of a piece of music having a clearly defined beginning, middle and end. However, not all pieces can be said to have clearly defined shapes in time; although a classical symphony or a three-minute single may have self-evident beginnings and ends, other musical forms such as a traditional Javanese gamelan piece or a twelve-bar blues can always occur 'one more time'. This leads to the idea of repetition, which (unlike closure, or definite structural ending, does seem common to almost all musics, though occurring in a variety of ways. Repetition is easily heard as the essence of gamelan music and of the music of recent Western composers such as Philip Glass or Steve Reich, whereas a piece of serial,

atonal music may be heard as always changing and never repeating (although consisting almost entirely of 'repetition'). The 'repetitions' in serial music can be thought of as transformations rather than simple repetitions: a transformation of musical material being at its simplest a varied repetition. Transformations may vary the original material (eg. a tune) so much that it becomes unrecognisable, by, for instance, slowing it down or playing it backwards.

The ideas of change, closure, repetition and transformation may seem too abstract or too simplistic to help us understand our musical behaviour. They do, however, help us to describe and define aspects of music which can't be defined in purely physical terms. Perhaps the most explicit example of this is in relation to melody (common to many, but not all, musics). A physical description of a melody could only exist in terms of a list of frequencies, frequency ratios, amplitudes and durations in time. The physical descriptions of performances of 'My Way' by Frank Sinatra and Sid Vicious would differ in almost all respects. Yet the two performances would probably be perceivable as being of the same song, even if the words are not considered. What is unaccountable for in physical or even psychophysical terms is not particularly that two different series of events (frequencies, etc.) should be heard as similar, but that a series of events should have (or be heard as having) some specific identity as a 'melody' in the first place. This is only accountable for in terms of broad human capacities to integrate (connect) events in time and to comprehend structure — deriving or imposing it — in such series of events. One framework within which these capacities can be investigated is contemporary cognitive psychology.

The cognitive psychology of music is probably best defined not in terms of 'what do we know about how we experience music?' but in terms of 'how do we know about how we experience music?' Although the psychology of music is to some extent a body of knowledge about how people experience music, that body of knowledge is constantly changing under the pressure of new ideas and experimental results. The psychology of music consists primarily of models of how we interact with music and of methods for testing the validity of these models. Current psychological models of how we comprehend and act on our surroundings tend to view the process of comprehension as interactive; that is, what we perceive is not determined solely by what exists in our surroundings but also by our ability to impose or extract structure and information selectively from the surrounding world.

These models have particular implications for our experiences in listening to and performing music.

One such simple implication is that music will make sense according to how we derive structure from it, which

'Someone familiar only with Verdi operas may not be able to make sense of a North Indian raga... they may therefore dismiss it as not being music.'

could be considered dependent on our previous experience of music based on similar principles. So someone familiar only with Verdi operas may not be able to make sense of a North Indian raga (or vice versa); they may therefore dismiss it as not being music. In this case the components which a culturally-skilled listener would identify as occurring in music and as constituting musical structure would be unavailable to a listener unfamiliar with that culture, so that musical structure would seem incoherent or even absent. Similarly, a classically-trained violinist attempting to play traditional fiddle music might find that, although all the notes were there in the right order, their performance didn't sound quite right. What is important in classical violin performance (quality of tone, etc.) might not be important or appropriate to fiddle music. So although the violinist might be able to make some sense of the fiddle music, it may be distorted to fit the violinist's own musical awareness.

So musical structure can be thought of as dependent on at least two factors; the physical phenomena (sounds) constituting the music, and the listener's or performer's ability to comprehend the structure of the sound. As both musics and people vary widely, the terms in which music and people's ability to comprehend it are defined psychologically have to be very general. Hence the use of such terms as 'change', 'closure', 'transformation' etc., which are applicable to a wide range of musics, and terms such as 'memory' and 'attention', which can be seen to underlie a wide range of human cognitive abilities. Because of this variation between people, experiments on, say, perception have to test numbers of people and have to express their results as tendencies, eg. that most people, most of the time, would perceive such-and-such a piece in such-and-such a way.

In spite of, or perhaps because of, this generalisation, the study of musical cognition has revealed a range of specific principles which could apply in many musical perceptions and performances. For example, in describing the perception of a succession of notes as a melody we can refer to the relation of the notes to

an overlearned schema (such as a scale), to the likelihood of successive notes being perceived as connected or 'streamed' (decided by the relative separation in the time and pitch domains), and to the resultant melodic contour. Each of these principles (reliance on overlearned schema, stream and contour formation) seem to be fairly general and can themselves be referred to even broader cognitive principles such as category formation and selective attention. So ideally, purely musical concepts such as scale, key, metre and harmony have to be broken down into very general terms before we can either explore them or begin to understand them in psychological terms.

'Cognitive psychology is not the only way in which to investigate our experiences of music; it doesn't explain why some music is judged 'better' than other music.'

Of course, cognitive psychology is not the only (and frequently not the best) way in which to investigate our experiences of music. Cognitive psychology doesn't tell us why we make or listen to music; it hints at but ultimately doesn't explain why different cultures produce different musics. But then, it's not intended to. To a large extent, psychology has its own appropriate domain of enquiry. For a psychological understanding of a particular aspect of music to come about, that aspect of music must be expressed in terms which psychological models and methods can be used to investigate anthropologically or sociologically; others, such as musical value judgements, might be better approached via aesthetics or musicology.

However, psychology does have a bearing on all these questions, since at the centre of psychology is an attempt to understand the consciousness which asks the questions. It is not so much the question itself as the form in which it is asked which makes it amenable to psychological investigation. Currently, the study of psychology of music is still in its infancy. Although the human experience of music has been the subject of analysis for over two thousand years, it is only relatively recently that the aim of that analysis has become the understanding of human experience of music which currently co-exist, and are constantly coming into existence. For one of the constant features of music and of our experience of it is change: to misquote an all-too-well-known politician, 'there is always an alternative'.

Ian Cross

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- Useful handclap percussion sound
- Triggered by hand, stick or external input
- Variable tone colour (resonance frequency)
- Variable reverberation effect

The handclap sound seems to have become a natural part of any percussion setup, acoustic or electronic. The Amdek handclap will provide an acoustic drummer with this percussion sound, where the sturdy pad can be struck directly with a drumstick. The trigger input socket also allows the unit to be used with an electronic percussion machine, or even a computer. Alternatively the pad can be struck with fingers, making it a useful addition to drum machines like MPC's 'The Kit', or Mattel's Synsonics.

Apart from a sensitivity control, a 'dry' control determines the resonant frequency of the clap sound. The 'hall' control introduces a variable degree of quite convincing simulated reverberation.

The Kit

The Amdek HCK-100 Handclapper Kit comes in bubble-pack form, complete with all parts, a spanner for tightening nuts and a detailed instruction sheet. The extra tools required are a 15 to 30W fine-tipped soldering iron, wire-cutters and strippers, small pliers and a cross-head screwdriver. A PP3 battery powers the unit, although an external DC 9v input jack is also provided.

Parts identification is best done by first laying them all out so that they can be checked off one by one, using the component drawings in the handbook for guidance. Step-by-step assembly commences with the preparation of the eight lengths of coloured wire, using the scale provided in the handbook. These are then soldered to the three potentiometers. After cutting to length and preparing the battery snap and piezoelectric pickup wires, these and the pot wires are soldered to the pads on the ready-built PCB assembly, as shown in steps 1 to 6.

Once the pots are secured to the inside of the case in steps 7 to 9, the piezoelectric pickup is adhered to the underside of the top panel using a self-adhesive foam ring. In steps 10 to 12, the PCB assembly is held in place in the case by means of the jack bushes, which are secured with nuts. A self-adhesive protective

film and a self-adhesive foam pad insulate the PCB from the case bottom. A further foam pad serves to restrict the movement of the battery.

Steps 13 to 16 describe the completion of the unit, where the case base is screwed in place and provided with self-adhesive feet and an easy access rubber battery compartment cover,

which doubles as a non-slip foot. All that remains then is to fit the three control knobs and apply the self-adhesive strike-pad to the top surface of the cover.

Circuit

The signal from the piezoelectric pickup, resulting from vibrations in the panel due to the pad being struck, is amplified and shaped by IC6, Q4 and Q5. The trigger signal then appearing at the emitter of Q5 is split three ways to initiate three separate envelope controllers. The simple path via D9/R27 determines the overall envelope of the dry signal.

The gated oscillator formed around IC2 produces typically four discrete envelope peaks. Both of these envelopes are combined by Q1 and Q2 to control the gain of the transconductance amplifier, IC1. The sound source is white noise generated by the pseudo-random binary sequencer, IC4 and 5. The noise is bandpass

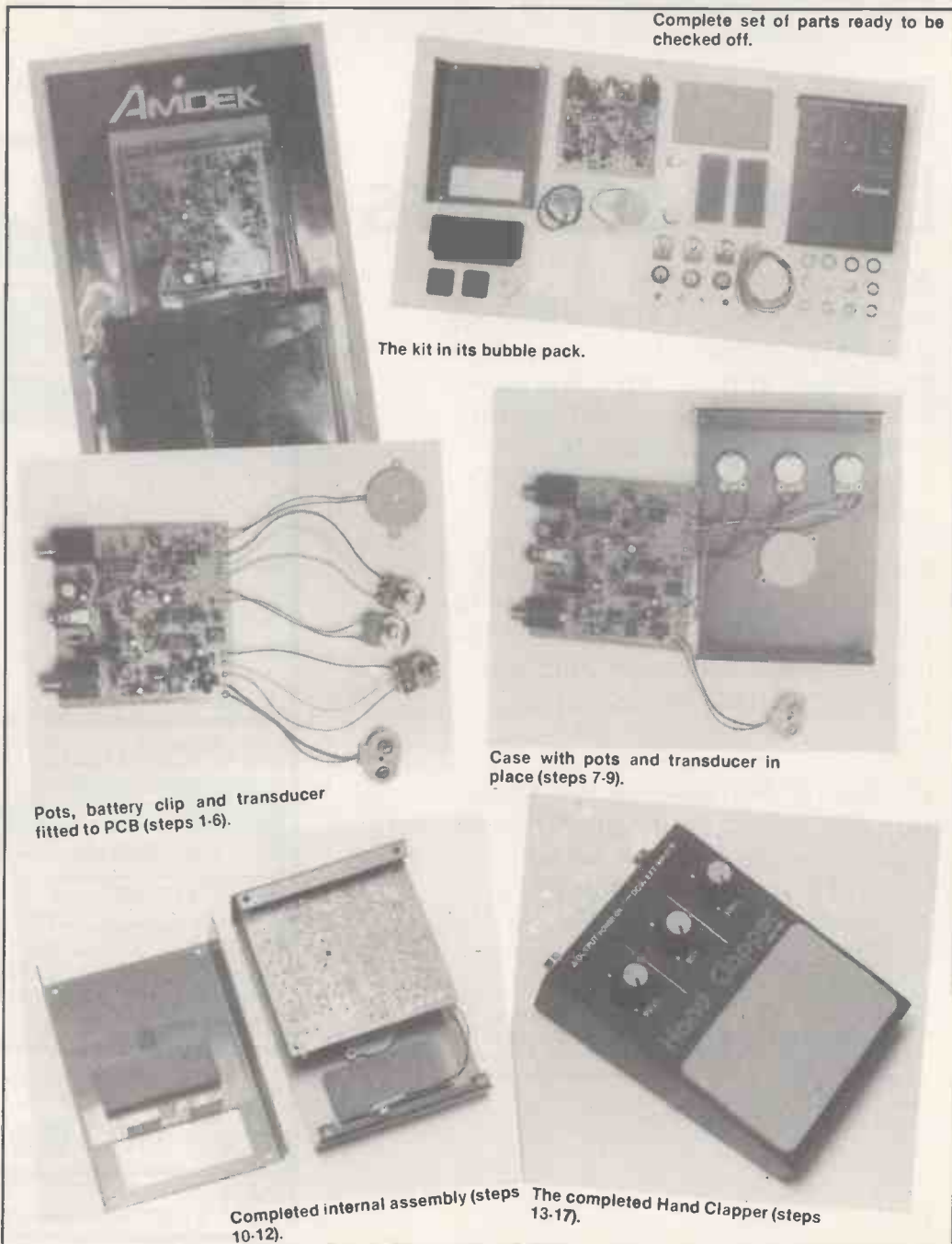
filtered by IC7 at a frequency determined by the 'dry' control, and fed to the transconductance amplifier.

The third envelope path via D8 gates the filtered noise, via an additional lowpass filter C22/R60 to IC3a. This then becomes the 'hall' signal. The dry and hall signals are mixed and routed to the output by IC3b.

The overall effect is a rapid succession of filtered noise bursts simulating an ensemble of discrete handclaps, followed by a slowly decaying lowpass-filtered noise simulating reverberation. The individual noise bursts are not separately discernible though; the effect is that of a well synchronised cluster of handclaps.

Operation

The hand-clapper kit was assembled without any problems and worked first time. If you do have problems however, you can contact the Roland 'Hot Line' on 01-847 1671.



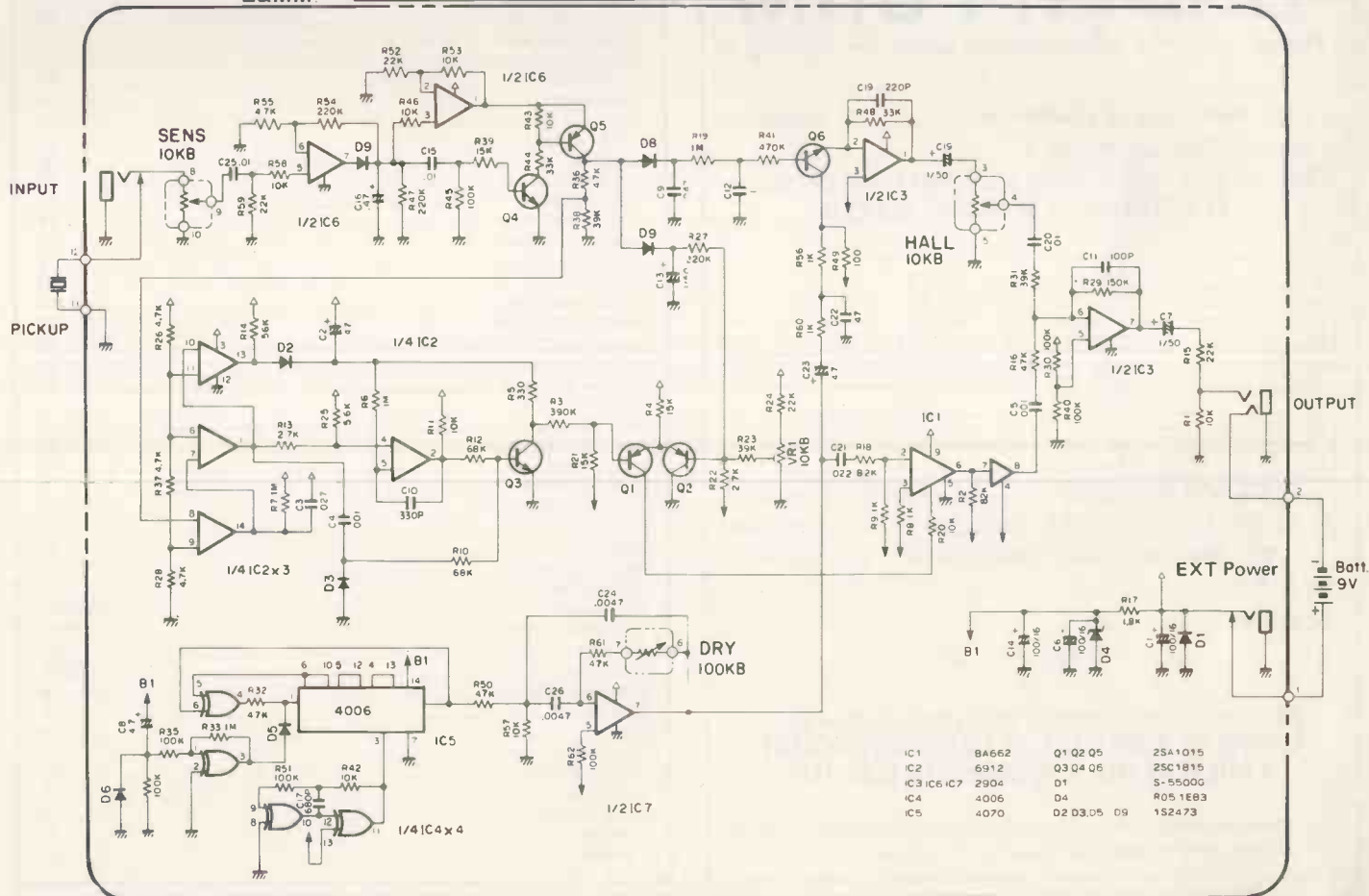
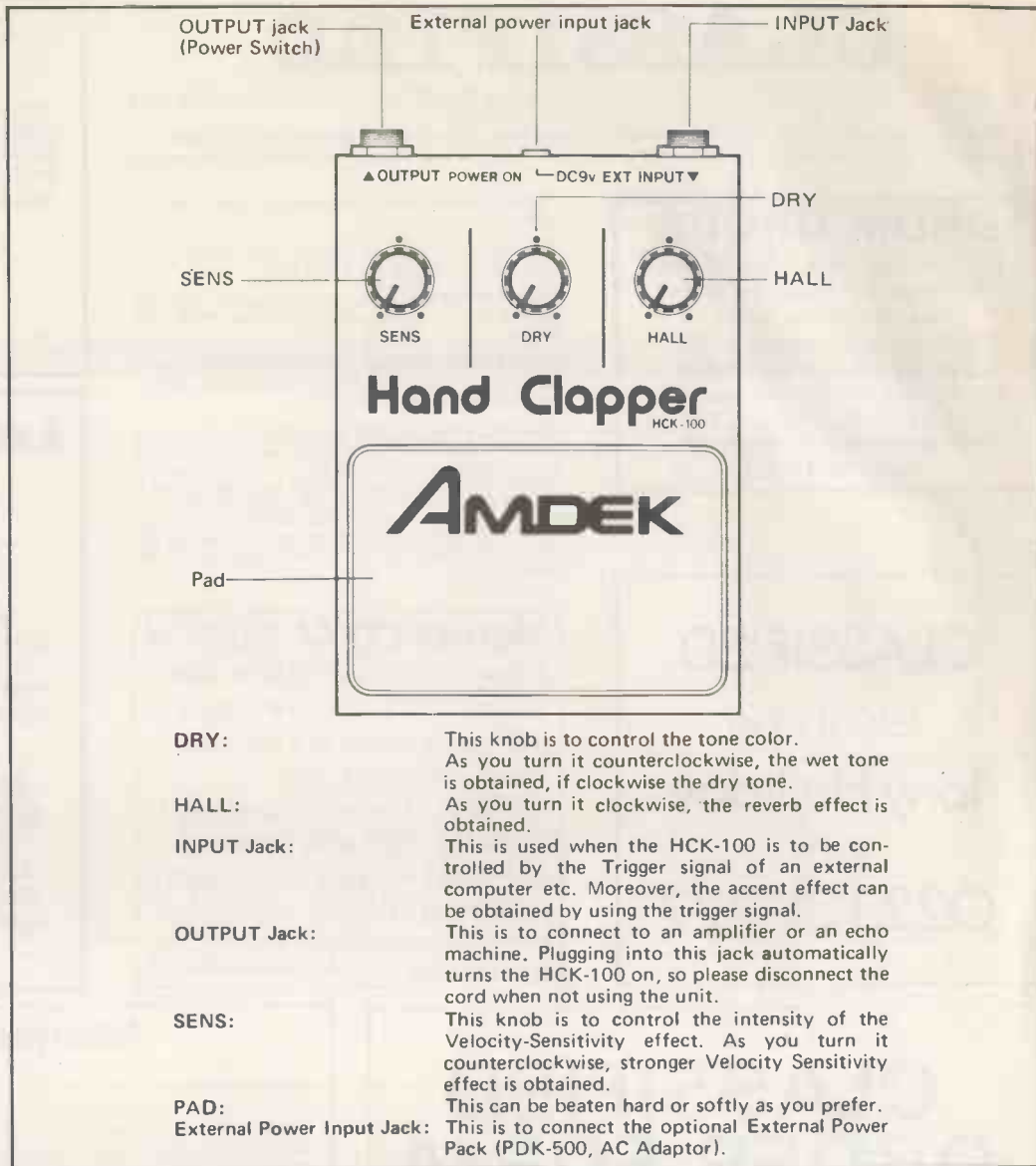
The unit performed very well, producing a good, attractive clap sound. The 'dry' control varies the tone of the sound from a thin clap to a deep, cupped-hand clap. The reverberation effect was found to be quite convincing, particularly with deep clap sounds. The unit was also quite sensitive, enabling it to be triggered with the fingers with the sensitivity control fully clockwise.

Despite suggestions to the contrary in the handbook, the handclapper lacked any useful degree of touch sensitive dynamics, although it was found possible to control the amplitude of the 'hall' signal dynamically to some extent.

Modifications

Although Amdek do not recommend specific modifications to the unit, the following suggestions might be worth experimenting with. First, since the output level is rather low, you may like to link out R15 to increase it. Secondly, if the clap tone is too thin, changing C24 and 26 to perhaps 0.01uF will deepen the tonal range of the dry control considerably. The third suggested modification is to increase the delay between the bursts of noise. This can be done by increasing the value of R6. Unfortunately, unless R7 is altered by the same amount, the number of bursts will be reduced. Possibly both of these resistors could be replaced by 2M2 presets so that both the length of the cluster of bursts and the burst repetition rate can be independently adjusted.

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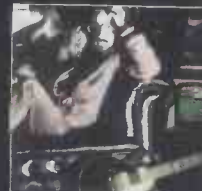
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