

## COVER FEATURE

# KORG LEGACY COLLECTION

✦ THREE CLASSIC KORG SYNTHESISERS IN A BRAND NEW WRAPPER WITH A DEDICATED HARDWARE CONTROL SURFACE AND ALL FOR £399. DAN DUFFELL SEEKS THE FUTURE DOWN MEMORY LANE...

**THIS REVIEW HAS** been like a bit of a family reunion for me. At various times in my life I've been lucky enough to spend a great deal of time working with three particular musical instruments that belonged to collaborators (and very good friends). I've worked with, and to be honest, like a true synth' geek... I have a horrible suspicion that I miss the machines more than their owners.

The machines in question are all synthesisers and all are made by Korg; they are the MS20, the Poly Six and the Wavestation. The reason I miss them is extremely simple: they are classics in the truest sense of the word because they are unique. Unique in the sense that they make very particular noises that cannot be made any other way. There is a certain something about the way they do what they do that gives them an instantly recognisable character, a character that you are very familiar with, whether you actually know it or not.

Like all great instruments they have influenced a generation of musicians and played a significant role in shaping music as we know it. Their tones have graced a thousand seminal pieces of music and have been sending us all crazy on dancefloors for quite a long

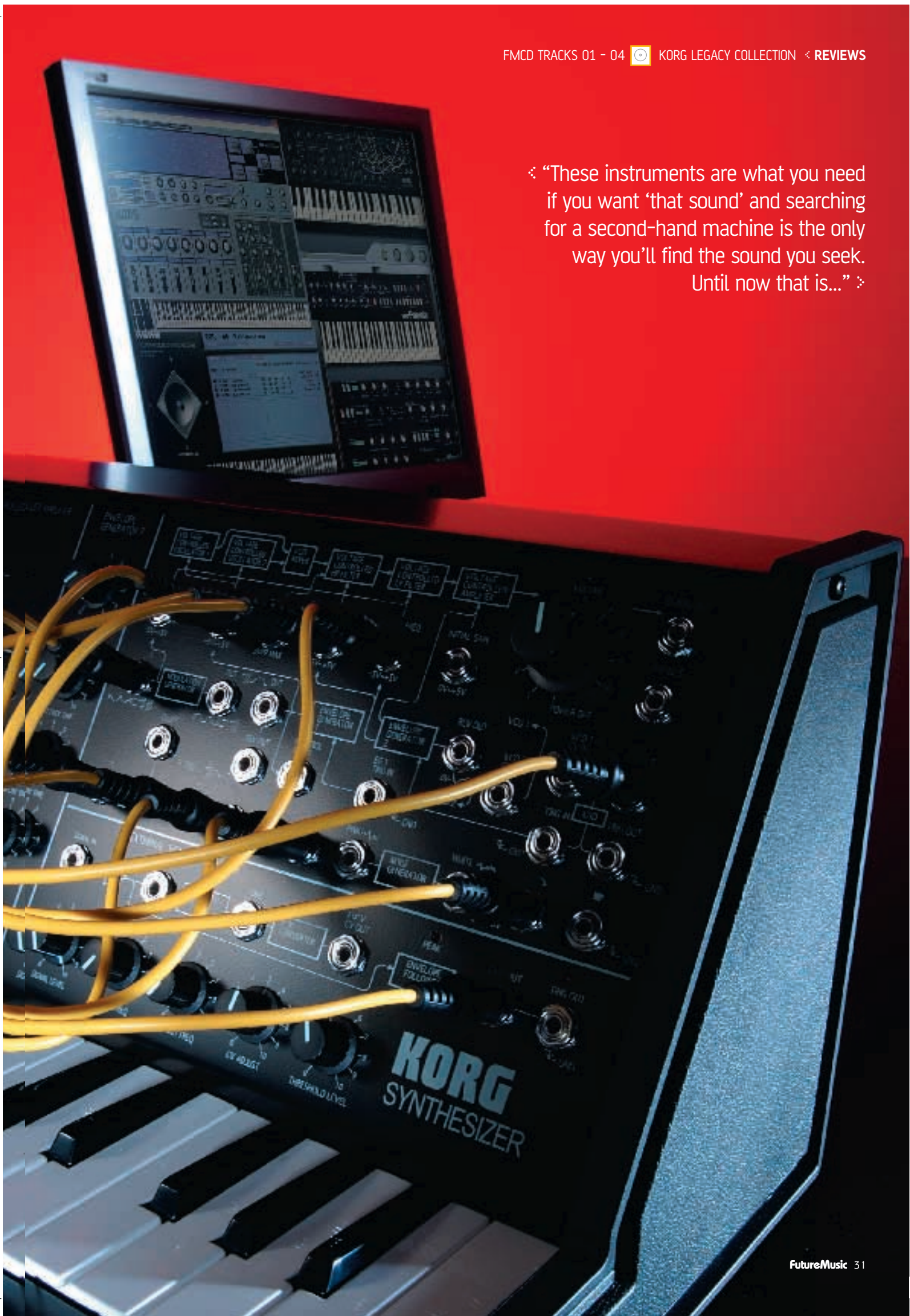
time now. They have energy, sparkle and character by the bucket load.

The most obvious aspect of what makes these instruments so special is the sounds that they produce. The MS20 and Poly Six are proper analogue synthesisers, so the sounds they make are down to the very particular combination of specific components and the way all of those components have been combined. The vintage technology they employ is of it's time, it's unreliable (many analogue synthesisers drift out of tune) and over-sensitive and prohibitively expensive, both in the sense that if you can find one it will cost you and in the notion that the factories that made their components are long gone, so setting-up a mass manufacturing operation to put them back into production is impossible.

It's these simple practical facts that have kept their cult status and value riding high. The Wavestation is a relatively early digital synthesiser and one that pioneered a completely new way of synthesising instruments, which again makes for a unique sound. These instruments are what you need if you want "that sound", and searching for a second-hand machine is the only way you'll find the sound you seek. Until now, that is...



◁ “These instruments are what you need if you want ‘that sound’ and searching for a second-hand machine is the only way you’ll find the sound you seek. Until now that is...” ▷



 FICD TRACKS 01-04**£399****INFO****Korg Legacy Collection**

Software instrument collection

**System requirements**

PC Minimum 1.3GHz P4.  
Recommended P4  
2.4GHz. Windows XP  
(not 98 or 2000)  
Min 256Mb RAM.  
Recommended 512Mb  
or more.

*continued opposite***Re-issue**

Now you can buy the Korg Legacy Collection instead. It consists (so far) of five different elements; our three classic synthesisers (presented as software instruments), the 'Legacy Cell' and a control surface.

The 'Legacy Cell' is a software interface that combines two instances of the MS20 or Poly 6 (not the Wavestation), two insert effects per instrument, two master effects and a cool layering system to form a single monster Softsynth.

The Legacy Control Surface is the fifth piece of the jigsaw, a remarkable piece of work; it's a clone of the original MS20 hardware that connects to your

computer via USB and acts like a standard MIDI Hardware Control Surface.

**Fancy mathematics**


Turning a hardware synthesiser into a software clone is not always an easy business. The Wavestation is a digital instrument, so it has been possible for Korg to use the original underlying code and algorithms from the original hardware instrument, as it has always been. The challenge with analogue gear, however, is far more complicated.

With the MS20 and Poly Six, Korg have employed what they're calling 'Component Modelling Technology', or CMT. With most modelled soft synths

you're getting a digital model of the sounds produced by the instrument.

With CMT, Korg have modelled each individual component used within the original circuit and then used these component models to build a kind of cyber version of the original instrument. The idea is that this will produce a 100% faithful rendition of the instrument, that will sound like the original and behave and respond like it too. A tall order for an instrument like the MS20, which is legendary among 'those that know' for two things. Firstly, its patchbay that enables the user to totally re-arrange the way its components are strung together. And secondly,



Korg Legacy collection   
— dive in there...

its external audio input that feeds sounds through its architecture and actually generates Control Voltage and Envelope information from those external sounds for use as elements in the synthesis process. A rare system with almost limitless sonic potential...

In the name of versatility, all function as either VSTi or as standalone applications. And after install there are the usual audio buffer and MIDI settings to be made, but there is very little to get wrong. So the burning question is, have Korg pulled it off?

### The basic Legacy interface

What you see when you fire-up any of the instruments in the collection obviously depends on which instrument you load. As usual with VSTi plug-ins, all the instruments are presented within a non re-scalable window.

The Wavestation and the Legacy Cell interfaces have both been built to suit the format, but for the MS and Poly, a means of displaying old bits of hardware is called for, and they both use the same basic on-screen interface. In the

bottom-left corner is a name strip showing the currently selected 'program', accompanied by a couple of selection buttons. In the bottom-right are five buttons that switch the viewing area to display different things. These are labelled; Main, Edit, Config, Prog List and Write Prog.


The 'Main View' is a virtual representation of the whole of the front elevation of the associated hardware machine. This gives quick and easy access to all of the controls at a glance, and provides on-screen keyboards and the various 'mod wheels' for auditioning sounds. You can use the mouse to edit settings from this view but because of the reduced viewing area, all of the graphics are a little small and the text labels are a bit tricky to read. This has been countered in two ways. Within the main view, when you pass the mouse over a control, a box appears with the name of the control and its current setting.

This is fine for making the occasional tweak, but when it comes to doing any serious sound-building you need to hit the Edit button. Edit view

enlarges the control surface and with both instruments this means losing the keyboard and Mod wheels. With the Poly Six, all of the relevant controls fit nicely into the available space, but there's a bit more to the MS20, so they've provided a horizontal scroll bar to let you move back and forth between looking at the knobs or the Patch Bay.

The Config Page provides access to; a MIDI Filter to exclude Control Change; Program Change and Channel Pressure messages if desired. It's where you set up which controllers you wish to assign to the four External Control sources and their Polarity. It's also where you set up Master Tuning and can even create custom-tuning for the individual notes on the keyboard.

The Prog List is simply a screen displaying a list of 32 preset Programs with Load / Save controls. The Write Prog button is there for quick saving, you hit it and you're immediately shown the Program List so that you can choose where you want to store your current edit.

So, with the basics covered, let's delve into the different components. 

### INFO (cont.)

Audio and MIDI interface, USB port

#### Mac

Minimum G4 800MHz, Recommended G4 1.25GHz. OS X (not OS9) Min 256Mb RAM. Recommended 512Mb or more. Audio and MIDI interface, USB port. Format: VST, Audio Units

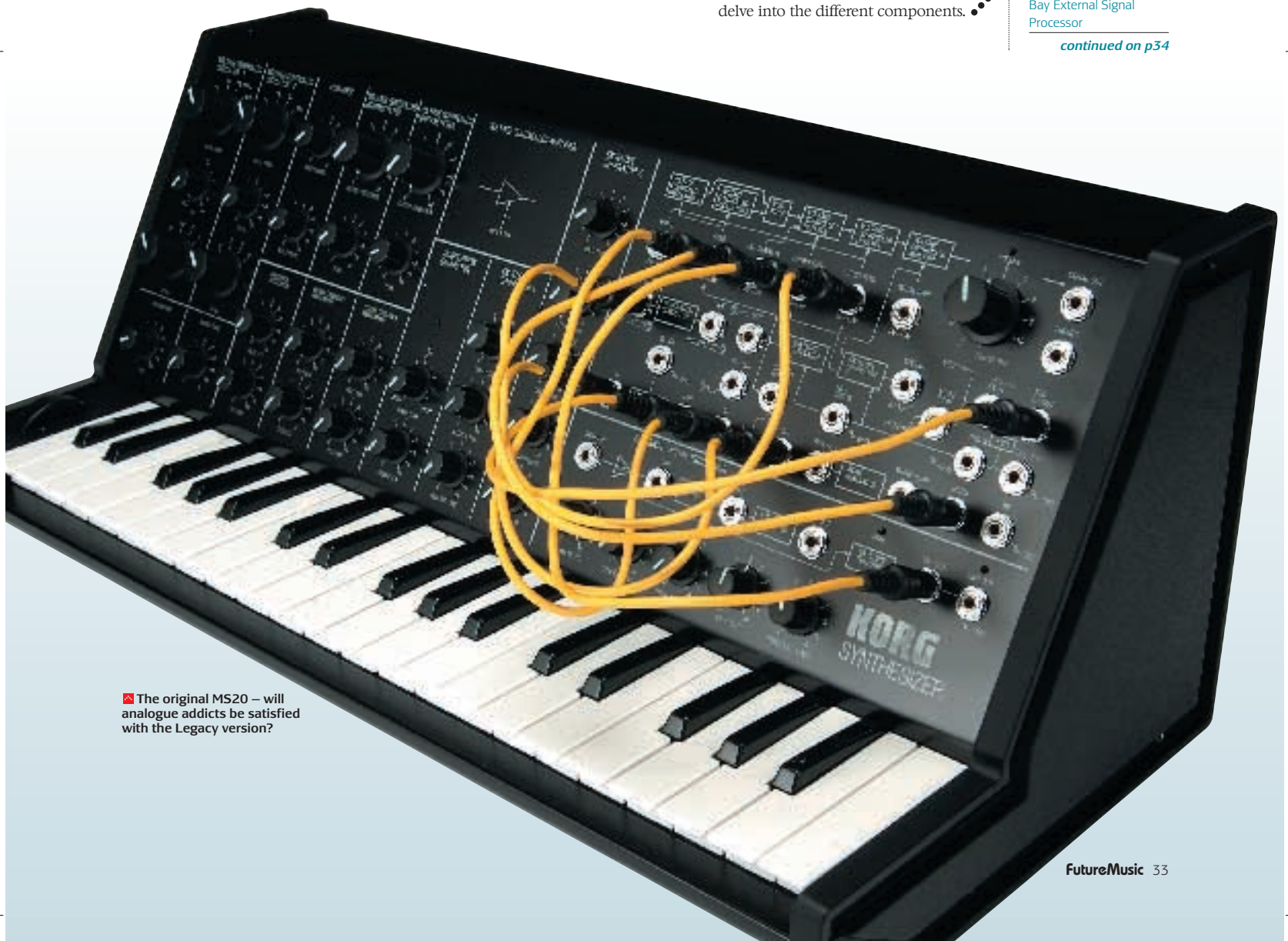
#### Main features


Modelled MS20 software synth  
Modelled Poly Six software synth  
Wavestation software synth  
Legacy Cell software instrument  
Hardware USB control surface  
PC & Mac compatible

#### MS20 Legacy Specifications

2 Oscillators  
Pulse Width Modulation  
High & Low Pass Resonant Filters  
Modulation Generator & Routing control  
2 Envelope Generators  
Comprehensive Patch Bay External Signal Processor

*continued on p34*



 The original MS20 – will analogue addicts be satisfied with the Legacy version?

Legacy MS20 has  the bonus of MIDI

### INFO (cont.)

Full MIDI external control  
Cool multi-control Modulation  
32 note polyphony  
32 preset programs

#### MS20 Legacy Controller Specifications

USB host connection  
35 knobs  
36 socket mini-jack patch bay  
3 octave keyboard  
Mod wheel

#### Poly Six Legacy specifications

Unusual oscillator system

Low Pass Filter with keyboard tracking  
Routable Modulation Generator  
Invertible Envelope Generator

Arpeggiator  
Full MIDI external control  
Cool multi control Modulation  
32 note polyphony  
32 preset programs

#### Wavestation Legacy specifications

Wavesequencing  
Vector synthesis  
Complex multi-layered Performance structure  
Two effects processors  
New user interface  
On screen joystick  
64-note polyphony  
Full MIDI external control  
550 preset performances

*continued on p36*

Is the Patch Bay still  "touchie feelie"?



### THE MS20 - LEGACY

The original MS20 was born in 1978, a totally analogue hardware mono-synth. It's monophonic so can only play back one note at a time (so no chords). There's no MIDI (although, it can be retro-fitted) and as you can imagine, it can only play back one sound at a time (multi-timbrality only really came along thanks to MIDI).

It comes in an unusual kind of sloping 'L shaped' cabinet that, as you can see from the pictures, means that it had a keyboard along the front and then all of the rest of the controls mounted on a panel sitting up in front of you at about 60 degrees.

As with most analogue machines, all of the controls are laid-out on this one panel. The left half of the panel is occu-

piated by 30 knobs, while the right side houses a patchbay. Along the bottom of the patchbay are a collection of sockets and knobs devoted to facilities for incorporating sound from external sources.

### Hands-on appeal

For those who are totally new to synthesis, part of the scintillating joy of the MS20 is how "touchie-feelie" it is. Ignoring the versatility lurking in the Patch Bay, you can get outstanding results and hundreds of hours of flying time out of good old knob twiddling - just reach in, twist away and revel in wonder at the outrageous sound that pours forth. In a similar vein, I've seen people who have literally never touched a synth in their lives sit randomly plugging wires into holes in the Patch Bay, and not once was any damage done to

### TEN HANDS

The External MIDI Modulation facilities have been executed brilliantly. By right clicking on any control you can either use 'Learn' mode or a pull-down menu to assign incoming CC data to the parameter... but there's more.

Within the additional collection of on-screen controls, you will find two columns of five knobs, and these give you the power to adjust groups of controls from a single modulation source.

At the top of each column you have a pull-down menu of sources. Below this are five knobs with a range of +/-5 that act as offsets, so choosing a positive setting will cause the relevant parameter to be increased by incoming CC Data and a negative setting will cause a decrease.

The knobs in column one are assigned to; HPF Cutoff, LPF Cutoff, VCO1 Pulse Width, VCO2 Pitch and Amp. Column two are assigned to; HPF Cutoff, LPF Cutoff, FM MG (Frequency Modulation Modulation Generator), HPF MG and LPF MG.

the machine. Occasionally, (but only occasionally mind) they even managed to get some interesting sounds out of it.

### Time to get geeky

Ignoring the patchbay for a moment, the basic MS synth (as controlled by the knobs) is a two-oscillator beast whose signal flows in a fairly standard way.

Starting in the top left corner we have two sets of three knobs for the 

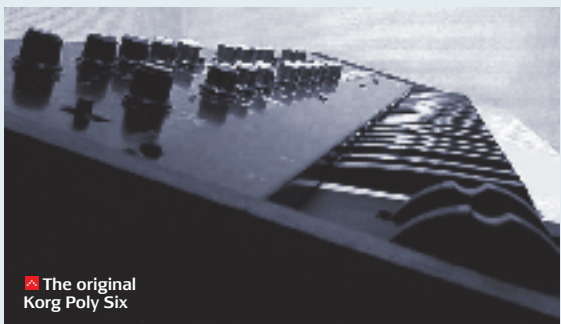



## SSSSH!


The original hardware versions of all three of our vintage machines suffer from varying amounts of residual background noise – they hiss! It goes with vintage hardware territory. These software versions do not, they're totally noise free.

With the MS and Poly, the original noise generation is down to analogue circuitry and we were wondering before the review if Korg were going to "model in" the background noise, but they evidently haven't.

With the Wavestation, the algorithms are identical and all digital, so the most likely culprit for creating the noise in the original hardware is the D-A conversion technology. The use of modern A-D/D-As has a significant impact on the sound of the entire package several ways. There is inevitably an increased dynamic range to all the machines that gives them a more detailed sound. It's a subtle difference but definitely noticeable.



 The original Korg Poly Six

 **FMCD TRACK 02**  
MS20:  
Darkside x bass,  
FB Dist Lead, Kick

## INFO (cont.)

### Legacy Cell Specifications

Combines two instances of MS20 or Poly Six  
On screen control surface  
On screen mixer  
Two insert effects per synth  
Two master effects  
128 preset performances

### Contact

Korg 01908 857100

### Website

[www.korg.co.uk](http://www.korg.co.uk)

oscillators. Osc 1 offers four waveforms (Tri, Saw, pulse variable Square and White Noise), all selectable via the big knob at the top, there's a Pulse Width knob just below it, while below that there's a 4-position Scale control (32, 16, 8 and 4 feet – these take the tone up or down by an octave).

Next to these the top knob for Osc 2 also offers up four 'waveforms' (this time it's Saw, two different 'fixed pulse' Square waves and Ring Mod). Below this is a pitch control (with a +/-1 octave range for Osc2 only), while below this is another 4-position scale control (this time 16, 8, 4 and 2).

The Ring Modulation setting for Osc 2 causes the two oscillators to be combined together (in such a way that the sum and difference of the combination replaces the original oscillators in the rest of the synthesis chain).

When in Ring Mod mode, you need to control how the whole oscillator section responds via a combination of the two Scale controls, plus the Pitch and Pulse Width controls... if you think the 'Ring Mod' system sounds esoteric, it is, but it produces wonderfully metallic, gritty, complex source tones.



 Patching the Legacy way

Nestling directly below the Oscillator controls are a knob for Portamento (aka how notes Glide from one pitch to the next) and Master Tune.

Moving right (along the top) from the main Oscillator controls we find a VCO Mixer providing independent Level controls for each Oscillator and then a High Pass Filter and Low Pass Filter, each with (big) Cutoff and (slightly smaller) Peak (aka Resonance) controls.

If you follow a vertical line down the panel from the two filters, each has its own Cutoff Frequency Modulation controls. These determine the extent of the effect of the other aspects of the synth on Cutoff Frequency. The way this works in practice is that you have a knob that sets how dramatically the Modulation Generator or Envelope Generator 2 effect Cutoff Frequency.

Nestling to the left of these (and below the VCO Mixer controls) are a similar pair of knobs, but this time they control the extent to which the Modulation Generator and Envelope Generator 1 affect Oscillator Pitch.

Heading over towards the right we find the Modulation Generator (aka LFO). It looks simple with just one Waveform and one Frequency (aka Speed) knob. It's not simple, it actually generates two waveforms (a triangle and a square) overlaid, so as you turn the Waveform knob you're altering the characteristics of both waves. It produces much more complex oscillations than your average LFO.

Still heading right, we next meet Envelope Generator 1. This has a Delay control (sets how long after 'Note On' the EG kicks in), Attack and Release.

The final column of knobs on the right side are for Envelope Generator 2. These are Hold, Attack, Decay, Sustain and Release, and thankfully it's a pretty normal Envelope Generator.

## Holey Cow

It's the Patchbay that makes the MS20 really very special indeed. I'm not going to attempt a full explanation here I'm afraid, because we'd be here for a long time. But what it does is enable you to scramble the brains of the rather elegant synthesiser that is the rest of the machine.

It lays out the block diagram of the circuit and provides insert points that allow you to 'interfere' with the signal flow. It was intended to do sensible things, like; using a cable to connect the modulation wheel to a desired parameter, or to bring some extra functionality to the machine in the form of a patchable Sample & Hold LFO, or to incorporate the extra Pink Noise Generator, or to use the handy Reverse Output sockets from the Modulation and Envelope Generators as alternatives to the usual forwards versions. It was also intended to enable interaction with external sources, such as other synthesisers (particularly its siblings, the MS10 and MS50) or the external signal processor (read on).

It was designed by folk that know what they're doing and who almost certainly presumed that the end-user does too... WRONG! It can be used to do totally stupid, random and utterly incorrect things that just create weird blips, squeals and screeches in the hands of the average idiot musician (such as myself).

Random plugging causes absolute mayhem and consequently can create an undeniably strange palette of stuff that would keep experimental noodlers like Autechre happy for...

“It can be used to do totally stupid, random and utterly incorrect things that just create weird blips, squeals and screeches in the hands of the average idiot musician (such as myself)”

well, probably not long, actually, because they're bonkers and I seem to recall them telling me that they modified their one.

It can also do the really cool thing that guitarists do... feedback. By patching the Phones or Main Output back into different points within the signal chain we get different nuances of wild screaming feedback that can actually be kept under control and used to provide ridiculously edgy and harsh sounds that are particularly great for bass.

### Intravenous audio

The icing on the cake, however, is the External Signal Processor. Running through the controls from left to right we have an Audio Input with accompanying Input Level control. Next in the signal flow (rather than physical layout) comes an Audio Output that takes a clean copy of the audio off to anywhere you care to patch it in (like the input to the Filters, for example). Next comes a Band Pass Filter with controls for Low Cut and High Cut. This BPF is for isolating different aspects of an incoming sound and increases the usability.

Then comes a Post BPF Audio Output, before we get to the Control Voltage Output. Analogue synthesis uses measurements of variation in voltage to do things like determine pitch, so here you get to generate appropriate Voltages from various types of audio and patch them into your synths.

There are two controls associated with the CV generator. One is for fine-tuning the voltage of the CV Output (in the hope of getting it in tune with the rest of the synth) and the other is a Threshold control that sets a level, above which audio will generate CV.

In parallel to the CV generator, there's an Envelope Follower that creates Envelopes (the feed is taken Pre BPF). And finally there's a Trigger Output.

All in all you have several different ways to combine the incoming audio signal with synthesised sounds or to use the incoming audio to generate CV, Envelope and Trigger signals to help trigger and shape the synth sounds. If you followed the intimations in the manual, you'd think that the ESP is there to let you use instruments such as guitars to interact with the synthesiser.

If you are an experimental electronic musician, you take one look at it and wonder what would happen if you were to use a drum beat to influence the behaviour of a bassline or any number of other weird possibilities. With some persistent practice with the ESP and the Patchbay, this side of the MS20 is a dream come true for those in search of the sonically twisted. If you just want to do a bit of cut-up disco filtering that's cool too.

When in standalone mode, the ESP takes its audio feed from the input of your soundcard. When used as a plugin within a DAW, however, the ESP doesn't work. This is because Korg have found a far more elegant solution to routing audio to it from the DAW. They've created the MS20 EX. This is an identical instrument that can be used as an insert or send effect in your DAW.

### More bounce to the ounce

So far everything I've said is as true of the original MS20 as it is of the MS20 Legacy, but the Legacy version goes several steps further, simply because this is 2004, not 1978. It does MIDI for a start and is 32-note Polyphonic. Because it

does MIDI it has added External MIDI Modulation capability (see the 'Ten Hands' box on page 34).

Lurking in a new collection of controls to be found in the onscreen control surface, (to the left of the original collection of knobs when in Edit view) are a few things that only become relevant within a MIDI & DAW environment. There are controls for Polyphony and a Unison mode (that creates an additional copy of the sound and provides control over stereo spread and detune), as well as Retrigger, Pitch Bend Range, Transpose and Pan.

And finally a knob that introduces a random element into the Oscillators and Filter Cutoff. This is intended to bring a little of that analogue unreliability back into the system and works really well by causing subtle random tuning drifts.

### Touch me baby

The controller is impressively faithful to the original MS20 hardware, although it is actually only 84% of the size of the original. It sports a three-octave keyboard with smaller keys than the original and the control panel has been reduced in size in places. To be honest, the original was a little over generous with the panel finger room and you don't notice the difference.

They've also managed to find very similar knobs that feel very solid to use and a scarily similar clunky modulation wheel. The Patchbay uses mini-jack rather than quarter-inch jack, which makes for a slightly different look. It's important to understand that the controller itself has no audio functionality, so the various audio input and output sockets are non-functional in terms of audio, but they



••• certainly do work in the context of 'virtual' patching.

You're supplied with a set of 'non audio' mini-jack patch cables and the whole thing feels very solid and satisfying to use. It's not possible to over-emphasise how much the presence of this controller increases the usability of the MS20 Legacy. Dedicated hardware controls and the way in which they encourage you to both experiment and manipulate in real time is a major factor in the appeal of analogue hardware. When it comes down to it, nobody has ever produced a Patchbay control surface before and I suspect without it, many users wouldn't delve into the potential it holds.

### Well cut my mustard!


Time for the answer then. The sound of the MS20 Legacy is stunning. Taken purely as the instrument it is, the thing sounds brilliant. It's superb for creating very hard-edged and enormously fat bass sounds, floor-filling distorted lead sounds, drums and dense vibrant pad sounds. Just like the original, the more subtle and gentle you are with your adjustments the more detail and breadth within the range of sounds it can produce, it reveals to you.

The fact that it sounds uncannily and really quite disturbingly like the original MS20 is a remarkable achievement. After a while I forgot I was using the software version. We had an original MS20 on hand and although there is little point of attempting a true A/B comparison because you cannot get the same sound twice out of the original, the Legacy certainly compares very favourably.

The real proof of the pudding, however, was always going to be the Patchbay and ESP – both are quite incredible and worthy of enormous praise. They actually do produce results that mirror the original machine right down to the weirdest, squelchiest blurps I could conjure. This simply could not have been achieved with anything less than Component Modelling. Using the Patch bay did highlight the enormous amount of maths going on in the background – when making patches with more complex structures, every once in a while I would make a connection and hear an odd artefact or two while it made up its mind whether I was really serious about the illogical stupidity of what I was demanding before deciding that it would make the resulting strange sound anyway, causing at most half a second of indecision.



 Poly Six Legacy

 **FMCD TRACK 03**  
Poly Six:  
Square bass,  
Square hollow pad,  
VCF Oscillation

## THE POLY SIX LEGACY

The original Poly Six was born in 1981, so it's a generation on from the MS20. It's an analogue machine, is six-voice polyphonic, so you can play chords with it or combine all six voices to deliver extra chunky single notes.

It has no MIDI (although again it can be retro-fitted), and comes in a full size five-octave keyboard, complete with wooden side panels and a fetching blue paint job.

Significant features for its day were an ability to store 32-programs, magnetic tape storage of program banks, an arpeggiator, onboard effects and an unusual synthesis structure that produces a unique sound palette.

### Mystery tour

The Main view of the Poly Six Legacy is probably not somewhere you'll spend much time. It looks good but you don't really *need* the keyboard and mod / pitch wheels. Also, while it faithfully displays all of the controls of the original, about a third of these are redundant on the Legacy version because they are for the Program storage and tape dump systems, that are now catered for much more convincingly thanks to the modern world of computers in which we live. We should all give thanks and praise for this because tape storage is a worryingly unreliable process.

So we're going to run through our architectural tour based on what's displayed in Edit mode of the Legacy Poly

Six, rather than the vintage configuration. The window is divided into sections for each aspect of the synth.

### VCO

Starting in the top left corner we have the rather unusual Oscillator system. It provides controls for; Octave (16, 8 and 4 feet), a three position Waveform knob (Saw, PW and PWM), a knob labelled PW/PWM, another knob labelled PWM Speed and a three-position Switch labelled Sub Osc.

OK, now buckle up... it works like this. The Octave switch is totally normal, as is the Saw waveform. If you select the PW waveform the PW/PWM knob adjusts the width of the pulse section of a Square wave over a wide and continuously variable range and the PWM Speed knob has no function.

If you select the PWM waveform, the width of the pulse section of the square wave is continually modulated by a variable LFO. The PW/PWM knob now determines the depth of the modulation (at zero, there's no modulation, so it's a fixed square wave). The PWM Speed control now determines how quickly (ie, how often) the pulse section is altered.

The result of this neat little arrangement when in PWM waveform mode is that what you hear sounds like multiple oscillators, because you're hearing multiple copies in rapid succession. So it sounds much bigger than a single oscillator could. Remember, this is right at the beginning of the signal path. •••

◀ “The Main view of the Poly Six is not somewhere you'll spend much time. It looks good but you don't need the keyboard, pitch and mod wheels and a third of the controls are redundant...” ▶

Legacy Poly Six edit 

There's also an additional Vibrato Intensity control that sets the range of the Mod Wheel generated Vibrato. Lurking behind the scenes there are six of these oscillators, which is how we get six-voice polyphony, so in Unison mode you're combining six multi-layered oscillators. The Sub Osc Switch generates a duplicate copy of the waveform, either one or two octaves below the original for an even bigger sound.

**VCF & amp**

Moving right, along the top, we meet the Filter. This is a much more usual 4-pole 24dB per octave Low Pass Filter with controls for Cutoff, Resonance, EG Intensity and Keyboard Tracking.

The EG intensity control not only sets how much the Cutoff is effected by the Envelope but can also invert the Envelope (it has a range of +/-5) which determines whether the Cutoff is either increased or decreased by the envelope.

The Keyboard Tracking sets the extent to which the Cutoff is altered according to the pitch of incoming

notes. The Envelope is duplicated and applied independently to each voice. Still moving along the top, up next is the Amplifier that only has two controls. There's an EG switch that makes volume changes follow the Envelope, or for notes to simply have an on/off 'gate' type action.

Next to that is the 'Attenuator', a +/-10dB volume control which is a little redundant – it was present on the original to balance the volume of individual Programs (prior to storage), so that you can switch from one to another without embarrassing jumps in volume.

**MG & EG & output**

Moving down a row and back over to the left we find the Modulation Generator (LFO). The original provided controls for Frequency (Speed), Delay (how long after 'Note On' the Modulation kicks in), Level (essentially a Depth control) and a 3-position switch marked VCO (routes the MG to oscillator pitch for a Vibrato effect), VCF (routes the MG to Filter Cutoff to create wah wah) and VCA (routes the MG to the Amplifier to create a Tremolo effect).

While we're talking Modulation, the Mod Wheel also generates a separate modulation wave that's routed to the Oscillators, so that with the MG switch set to VCO you get two overlaid modulation waveforms for added complexity.

Moving right along the row we arrive at a standard Attack, Decay, Sustain, Release (ADSR) Envelope Generator, and to the right of the EG we have Master Volume and Pan controls, Pan being new to Legacy.

Also new is the addition of a Tempo Sync and 'Interval' menu for the Modulation Generator. The 'Interval' menu

sets the basic note length to base the LFO on when Tempo sync is on (the Speed control then multiplies this value to keep the LFO synchronised with DAW tempo).

**Arpeggiator & pitch**


Moving down to the next row of controls, we start back on the left with the Arpeggiator. This consists of a Speed control and three switches; a 3-position switch for Range ('Full' means notes are sequenced over the full length of the keyboard, '2 Oct' restricts the notes to a 2 octave range, '1 Oct' restricts the range to 1 octave). Lastly, comes a 3-position switch for Mode ('Up' meaning note sequences always running up the keyboard, 'Down' meaning sequences running down the keyboard and 'Up/Down' meaning sequences that run in alternate directions). There's also a 2-position on/off switch for Latch so that the arpeggiator continues running after you let go of the note, continuing until you hit the note again. There are newly added Tempo Sync facilities for the Arpeggiator that operates in the same manner as the MG Sync.

Sitting over to the right of the Effects are controls for Pitch Bend Range, Tune (for fine tuning) and a newly added Transpose control (over a range of two octaves).

**So does it do it?**

Oh yes, it does it alright. The unusual synthesis structure and interesting Effects of the Poly Six produce a very distinctive sound. It's a sound underpinned by what amounts to extensive multiplication and re-multiplication of the same sound, which is what Chorus effects are based on.

The result is a dense sound palette that is much softer and more rounded than that of the MS20. It produces wonderfully large and strong bass sounds that have a lovely bouncy, rounded feel, despite being formed fundamentally from Square waves, and it's particularly impressive when it comes to pad sounds. It's famous for its multi-layered, warm, shimmering soundscape-style string tones. The Legacy version delivers it all impeccably, sounding every bit as lovely as the original Poly Six.

It retains that classic vintage warmth but seems to benefit very much from the increased clarity of modern technology. If this is what Component Modelling does, then I'm all for it. This really is a very convincing rendition of the original beast that would upset a few analogue purists if they were to undergo a blindfold taste test. 

**POLY SIX EFFECTS**

The Effects on the Poly Six are based on another LFO that modulates Pitch giving Chorus type effects. A Selector switch lets you choose between Off, Chorus, Phase and Ensemble. Chorus is a soft and gentle thickener of sound and the Phase has a stronger, more pronounced feel.

The original provides a Speed / Intensity control that has a dual action when in Chorus or Phase modes. As you increase the Intensity, it decreases the Speed, making for an unusually complex response from a single action. The Ensemble effect produces a complex, fast modulation waveform that produces a hugely distinctive and very pleasant multi-layered harmonic overlay. The Speed / Intensity control does not have any effect in Ensemble mode.



A bitch to program? 

#### FMCD TRACK 04

Korg Wavestation:  
Cats eye,  
Dubussy on wheels,  
Friptronix

## THE WAVESTATION LEGACY

The original Wavestation was born in 1990. The first incarnation, the EX, was a full size keyboard, followed by later rack-mountable incarnations, the AD and SR. It's from the MIDI age, so it's 32-note Polyphonic and 16-part multi-timbral.

There were two key features that made it special. It pioneered a completely new approach to synthesis called 'Wave Sequencing' and employed what Korg called 'Vector Synthesis'.

There was another feature that was very much of its time, too – the thing

## WHAT IS WAVESEQUENCING?

When you hit a single note on your keyboard a standard Sampler plays back a single sample (or perhaps even a few layered on top of each other). The Wavestation is also sample-based, but rather than use a single sample (or a few layered ones) it uses a sequence of Samples, played back one after another in response to a single note trigger.

You can have up to 256 steps (with a sample in each) in a single sequence. There are 365 basic samples to choose from, they are all different lengths and different types of building block.

Each individual step can be cross-faded with adjacent steps in the sequence. A series of steps can be looped. The sequence is then passed through a (digital) synthesis structure consisting of a Filter, Amplifier, two Envelope Generators and two LFOs. The technique essentially treats these sequences as oscillators in this simple synthesis structure and is therefore a clever hybrid between sampling and synthesis.

was a bitch to program. It was actually slightly friendlier than most because it employed the now very familiar Korg system of an LCD display with 'soft' function buttons around it to control the well-organised operating system. But as you will certainly discover, the synthesis technique underlying the Wavestation is quite complex and a little LCD screen was just never enough space to make it easy to use (despite the valiant efforts of the designers). What it really needed was a screen editor, and that's exactly what it has in its Legacy incarnation.

## What is Vector synthesis?

The Wavestation calls a single Wavesequence and it's associated Filter, Amp and so on a Voice. It can combine up to four Voices to form a single Patch. The Wavestation had a joystick on the front that looked a bit like the one you can see to the left of the Main view.

The four Voices of a Patch can be placed on the points of the diamond around the joystick. With the joystick in the centre, all four Voices will be 'mixed together' at equal relative levels, but move the joystick to the extremity of any point and only the Voice assigned to that point will be heard.

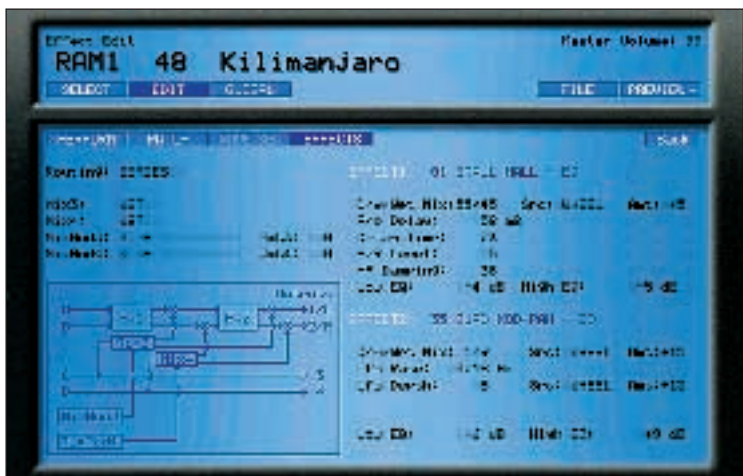
Move the joystick to any location in between and the relative level of all

four Voices will be adjusted to match. These joystick movements can be sequenced. You can set up to five consecutive 'points' (positions for the joystick) and determine the time it takes to fade from one point to the next after a note is struck. In the world of maths the term used to describe the path from one point in space to another, is a vector, hence the term Vector Synthesis.

## It's all in the performance

To complete our understanding of the structure of the Wavestation, we need to understand the Performance. A Performance can hold up to eight individual Patches. With the original Wavestation you had a choice between whether all of the Patches within a Performance responded to incoming note info as a single instrument, (Omni mode) or whether each individual Patch could be assigned a different MIDI Channel (Multi mode).

The Legacy version isn't Multitimbral because it doesn't need to be. It makes more sense to be able to use all eight Patches within a single Performance as a single instrument (with all the richness and density that that brings) and to just load up more instances of the Wavestation VSTi within your DAW as you want more instruments, just as you would with most VSTis. So, within the



 Legacy Effect example

Legacy WS, you are provided with facilities that enable you to set up keyboard and velocity-zoning for each Patch within the overall Performance.

### Plasmic surgery

Korg have taken the basic approach to the Operating System of the Wavestation and totally re-worked it for the new Legacy interface. What you see when you first start it is the Performance selection screen. There are 550 preset Performances (the entire original Wavestation library, including all of the optional expansion cards) supplied with the Legacy WS and they're organised in a simple set of 11 banks, each containing 50 Performances.

In deference to the original machine, the banks are assigned to buttons labelled RAM1 to RAM3 (because the standard unit shipped with 150 Performances stored in RAM) and then ROM4 to ROM11 (because there were seven more banks available on ROM cards). Saving your own Performance creations, should you feel the need to delve, is very straightforward.

Hitting the Edit button within the Main View takes you to the 'Edit Performance' page. This gives you a list of up to eight Patches that can be found within a single Performance. Along the bottom of the screen is a horizontal graphic keyboard zone map with a vertical graphic velocity zone map to the right.

To the right of the Patch list is a collection of editable parameters pertaining to layering (part level, effects bus routing and so on). Selecting an individual Patch calls up all its relevant info and highlights it within the zone and velocity maps. You can adjust zone / velocity settings by dragging and the other bits by clicking and entering numbers. Just above the Patch list are a

row of four buttons marked Performance, Patch, Wave Seq and Effects. The Performance button will already be highlighted by default and the other three take you off to three more specific edit pages.

The Patch Edit page is divided into three areas. There's a Voice list where you select and assign the four Voices within the Patch, while to the right of this is a Vector editing area. It has a square graph upon which you plot your Vectors and has two modes; Mix mode gives access to Voice Level Vector plotting. Mixenvmod mode enables you to set up the joystick to apply offsets to up to four different Modulation parameters at the same time as Voice level info.

Using the square is simply a case of grabbing and moving the dots, then you specify the time taken to move from dot-to-dot numerically in the data table next to the square. Running along the bottom of the Patch Edit Page we have an area that is allocated for editing Pitch, Filter, Amp, Pan, Envelope and LFO1 & LFO2. Each of these has a tab you can hit to call-up its editable parameters.

The Effects Edit page provides control over the two independent Multi-Effects processors, and the routing possibilities are pretty comprehensive; 4 separate inputs mean the Effects can be applied to individual Patches within a Performance, they can be used in Series or in Parallel and when used in Plug-in mode the effects can be routed to two pairs of stereo outputs that come up within your host DAW (the original Wavestation had two pairs of audio outputs too).

The Effect collection is classic top quality Korg, so expect that familiar, crisp Korg sound. There are 55 different combinations on offer ranging from


## BUILDING YOUR OWN WAVESEQUENCES

The Wave Sequencing page is where you get down to the nitty gritty of constructing actual WaveSequences. This is one area where the Legacy version really leaps forward thanks to graphic editing.

On the original all sequence construction was numeric, so you selected a step, assigned a Wave and then numerically set its level, crossfade value and the like. With the WS Legacy there's still a list where you select Waves for individual steps, but you also get a fetching graphic display showing each step as a consecutive series of blocks. Each block has a handle on top, which you grab to adjust step level and handles on either side to adjust crossfade settings.

To the right of the List is a collection of numeric fields where you set up modulation routing and whether forward or reverse looping will be applied to specific ranges of steps.



 Constructing your own WaveSequences

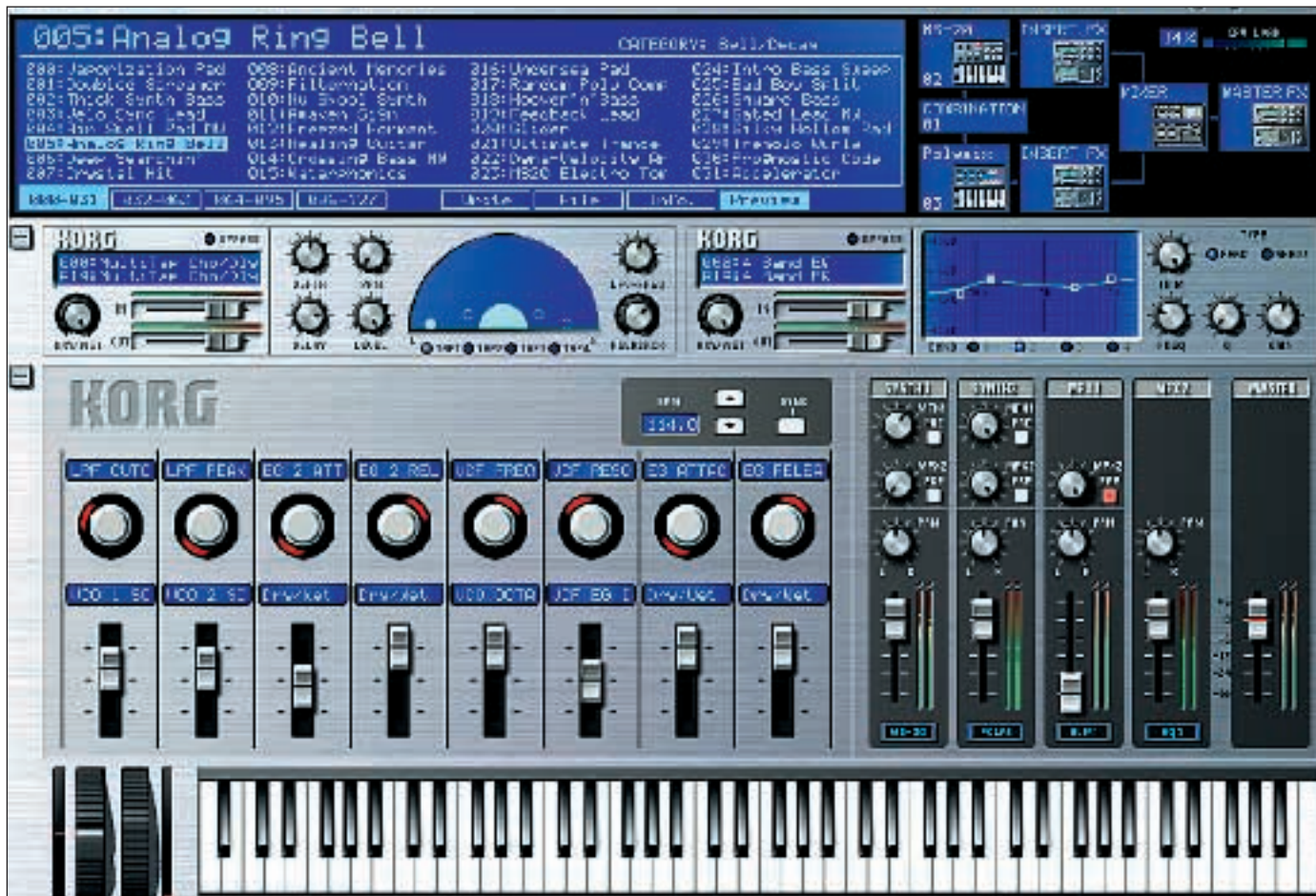
Reverb through Delays, Modulation Effects, Compression and Distortion to Vocoders (which, thanks to the four layer architecture, are particularly useful here). Most of them have a handy additional EQ stage.

### Action man?


The sound of the Wavestation is unmistakable and rather lovely. Its strongest suit has to be string / pad sounds and ambient textures. It can deliver very complex, multi-layered sounds that have their own kind of metallic edge. They are starkly beautiful tones that shine like the Mediterranean sun, but they are also tones that grow and morph over time with the many layers crossfading and interacting in wonderful ways.

It is also tremendously good at feedback guitar style tones because it possesses the same density of texture and change over time that you actually get from guitars.

Last but not least it produces a particularly beautiful range of bell-type tones because again, it has the right kind of multi-layered architecture to cope with the way bell tones form and repeat in layers. It is certainly a masterpiece which, despite sounding a little 'of its time', still has enormous value, regardless of the type of music that you are intending to produce.



Legacy Cell 

 **FMCD TRACK 01**  
Cell:  
Deepsearchin,  
Morphing Minor 7th,  
Velosync lead

**CELL MATES**

Having achieved such incredible and very faithful results with Component Modelling the MS20 and Poly Six, it would have been a bit of a crying shame not to make the most of their integration into a DAW environment. And this is where the Legacy Cell comes into its own.

The MS20 and Poly Six produce quite different types of sound, the MS is a quite hard and aggressive machine, whereas the Poly is rounder and richer in character. Putting them together is a natural progression. Neither of them had proper onboard effects processors and nor extensive preset voicing. The Cell brings these things together into a simple, attractive GUI.

**The interface**

When you load up the Cell you find yourself in the Performance View. Along the top, in a narrow strip, are

four buttons that take you to the different areas of the Instrument. These are labelled 'Performance', 'MS20', 'Poly Six' and 'Combination'.

The Performance View divides into three horizontal strips; top left we have a very straightforward browser pane where you can select from 128 Performances arranged into four banks of 32. To the right of this there is a block diagram showing the structure of a Performance. This clearly shows two instruments sitting in parallel. You can load any two instruments into these blocks, so you can have an MS20 and a Poly Six or two MS20's or two Poly Six's combined together.

It seems a bit of a shame that the Wavestation can't be loaded into these slots as well, but there you go. The signal then flows through the insert effects for each synth, into a mixer section and onwards through a pair of master Effects to the stereo output. In a strip across the middle of the Perfor-

mance View there are the two master Effects slots.

The bottom half of the View is devoted to an onscreen keyboard, eight assignable faders (with individual data display screens) and eight knobs (with data display screens), a mod wheel and a pitch wheel.

For each Performance a selection of synth parameters is automatically mapped onto the various controls. This keyboard and collection of controls looks remarkably like a Korg MicroKontrol, which is essentially what it is. When we hooked up a MicroKontrol it immediately recognised the Legacy and assigned the various synth parameters to the knobs and faders.

Setting up new Controller assignments to controls is simple, quick and easy. There's also a four channel onscreen mixer to the right of the control surface. The mixer section is basic; the two synth channels have Level Faders and Send Level & Pre/Post controls for the Master Effects. There are two channels for the Master Effects with Level faders and MFX1 also has a handy Send Level control that feeds it to MFX2 for series operation. The Master Output simply has a Level Fader.

“This keyboard and collection of controls looks remarkably like a Korg MicroKontrol, which is essentially what it is.”

Hitting either the MS20 or Poly Six View buttons devotes the screen to an almost identical interface to that used for the stand-alone versions of the instruments, the only difference being that within the Cell they each have a pair of Insert Effects modules strapped on to the bottom of the window.

### The cell Effects

Both the Insert Effects and the Master Effects use the same selection of Effects Processors. There are 19 Effects in total and they are; two Compressors, two Limiters, Overdrive+Wah, 4-Band EQ, Exciter/Enhancer, a formant-based effect (called a Talking Modulator), Decimator, Flanger, Phaser, Poly Six Ensemble, Multitap Delay/chorus, Cross Delay, LCR BPM Delay and four Reverbs. It's a versatile collection and all of it sounds very good indeed.

### A new voice

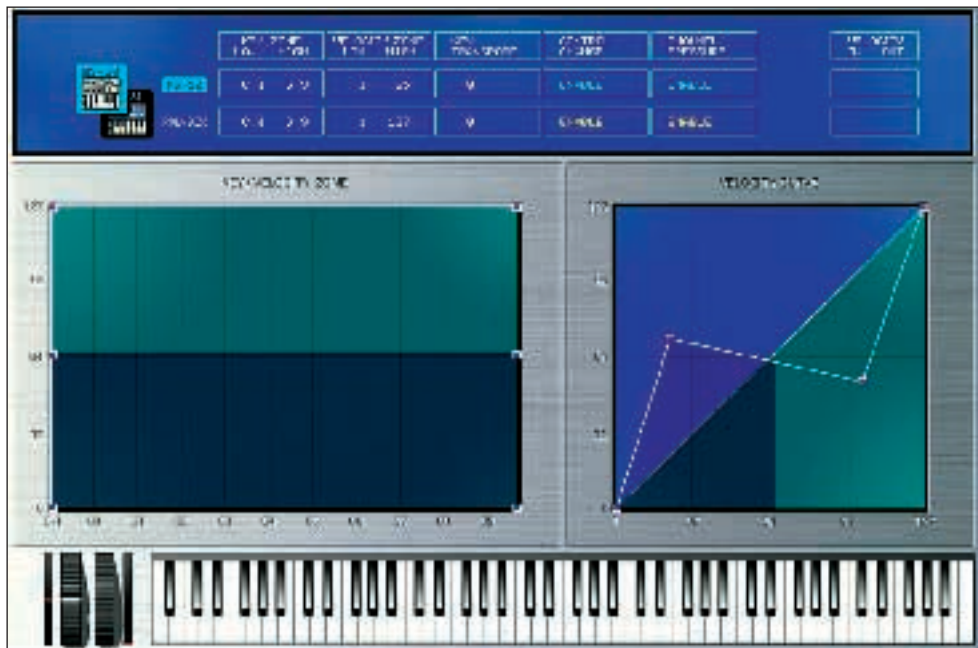
The combination of the MS and Poly Six works brilliantly. The two textures complement each other very well and the combination brings something new to each of them. And the addition of up to six Effects Processors within a single Performance is simply superb – it adds several more layers of texture to the equation that brings extra life to the overall sound and helps to gel the combination into something very solid, coherent and new.

What's particularly striking about the Cell is actually the standard of the voicing. Whoever created the 128 preset Performances is very good at their job. It's a remarkably current and fresh sounding collection that highlights the extent to which the sound of these machines is an integral element of the sonic palette of dance music.

### A new Legacy?

As you've probably gathered by now, I am very impressed with the Legacy Collection. I think it offers a vibrant, inspiring set of instruments that are worthy of consideration for a wide range of production styles and sonic tastes. Regardless of the inevitable debate about whether a software instrument can ever sound like an analogue one, the Legacy Collection passes the most important tests with flying colours... it is a great sounding collection that is well worth the asking price.

My own personal opinion about whether the MS20 and Poly Six Legacy emulations sound like the originals? The answer is probably not absolutely 100%. That said I feel it is way up there over 90% and in some ways the bits that



don't stick to the original model actually sound better. This is definitely true of the Poly Six, which has a much bigger sound to it.

The biggest challenge for Component Modelling is the Patchbay and ESP facilities lurking within the MS20 and these could never have even been achieved in software form without CM.

In the time I spent with Legacy I was extremely impressed. Apart from the occasional bit of hesitation while it tried to make sense of my demands it did very well indeed and produced a broad range of very interesting sounds.

There's bound to be some debate about the USB Control surface. Although obviously the entire system would work perfectly well without it, I think that the complexity of the MS20 Patchbay can be a bit daunting and somehow the entire process of using wires is sufficiently more tactile and perhaps novel for most users – hopefully to encourage them to roll up their sleeves and have a go. Dedicated hardware controls are far sexier than the mouse and once you get your hands on this one you'll understand why it's so important.

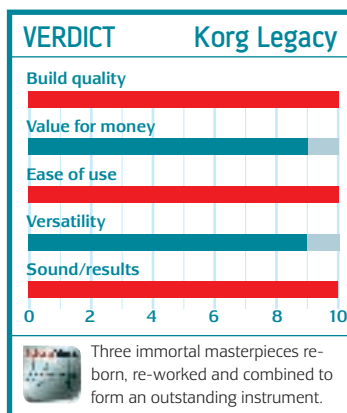
This does, of course, highlight a dilemma... the Legacy Control is an MS20, not a Poly Six, or any number of other vintage Korg classics which may yet get the Legacy treatment. The Legacy Poly Six is mapped onto the Legacy Control after a fashion, but it doesn't do the trick for me and I found myself reverting to the mouse. Until I connected the MicroKontrol, that is. The moral of the story is that unless you have a 'dedicated' hardware control sur-

face you're better off with one that has been designed from the outset to work well with a broad range of instruments.

In terms of how well the Legacy Collection fits into a modern DAW-based studio environment there are a great many clear advantages. The most obvious ones are cost, convenience and MIDI control (in all its guises, from straightforward sequencing to polyphony to automation).

One thing I haven't mentioned yet will be a big issue for some potential customers. It was tested on a 2.5GHz Pentium PC with 512Mb RAM and just loading up the Legacy Cell consumed approaching 30% of the CPU. You won't get too many instances of it up-and-running with all the other stuff that makes up a song! You won't get very far without a state of the art computer.

All in all though, it is a fabulous product that sounds wonderful and carries a sensible, competitive price tag and in a remarkable twist of irony... I miss the Legacy Collection already! **FM**



### Legacy combination

### ALTERNATIVELY

Although viable alternatives are a pretty objective business, the two below have based their synthesis on similarly high standards that involve component modelling.

#### Gmedia Oddity

(FM133, £79, 10/10/7/8/10)  
A faithful reproduction of the classic Odyssey, and yours for a very reasonable price.

#### Arturia Moog

Modular V (FM136, £199, 9/10/8/9/10)  
Classic Modular action in Moog form? Look no further... both tinkered with and endorsed by Bob Moog himself.