MODULATIONS
Assign up to 15 mono and polyphonic modulation pairings

FM/PM
Apply frequency or phase modulation to the oscillators

PULSE WIDTH MODULATION
Apply PWM to two keyboard ranges

AMP ENVELOPE
Shape the oscillators in ADSR or original Legacy mode

MASTER GAIN CONTROLS
Mix the outputs of PolyM's four filters

RESONATORS
A triple resonant filterbank for formant shaping

WAVESHAPE
Select square, saw or both for PolyM's two oscillators

KEYBOARD SPLIT
Move the slider to set the Upper/ Lower divide

24dB VCF
A globall low-pass filter for Upper, Lower or both

EFFECTS
Activate PolyM's effects, edited in the top panel

POLYPHONIC VCF
A software-exclusive per-note multimode filter

MODE FILTER
Apply eight preset 'brightness' filters, plus Vox Humana

XILS-lab
PolyM €149 PC MAC

Virtualising a venerable classic from the mighty Moog, does this quirky string synth still have a place in today's electronic music studio?

> Ridiculously expensive and notoriously unreliable, the Polymoog wasn't Moog's most popular synthesiser, but it certainly remains one of their most interesting. Released in 1975, it used the same sort of 'divide down' oscillator design as the electronic organs and string synths of the day, whereby two high frequency oscillators generated up to 71 simultaneous notes through a process of per-note frequency division. Not only was the high polyphony enabled by the technique impressive, but it lent the Polymoog a very particular sound, setting it apart with its wild pads and strings.

Two years in development, PolyM (VST/AU/ AAX) is an exacting plugin recreation of the original hardware, including every feature of the real thing, and a few major additions.

Divide and conquer
PolyM's two oscillators are designated Lower and Upper, indicating which section of the split

E0-D6 key range each is triggered by. The divide is set by dragging the pointer above the keyboard left and right, and various parameters throughout the instrument differentiate between Lower and Upper, making it possible to program two distinct sounds in a single patch – a bass at the bottom and a pad at the top, say. Each oscillator is switchable between saw and

> "Various parameters differentiate between Lower and Upper, making it possible to program two sounds"

square waves or a mix of both, and has its own frequency modulation LFO onboard, which becomes phase modulation when the square wave is locked to the saw. There's also independent PWM for octave 1-2 and 3-6. The concentric Fine Tune/Beat knob independently tunes both oscillators together and detunes the saw wave of the mixed oscillator for phasing and beating, with deeper tuning (+/-6st) and levelling of the saw applied in the Rank Tune and Rank Mix sections. Further levelling is done using the Master Gain Controls, which we'll come back to, and Octave Balance sliders, which enable up to 12dB of up/down levelling for each two-octave keyboard section.

The Loudness Contour section offers two styles of velocity-responsive amp envelope: a Minimoog-style three-stage model emulating the original design with separate Upper and Lower Decay settings, and a button for switching Decay to Release; and a standard

"Legacy mode never becomes intuitive but is certainly capable of creating some intriguing shapes"

ADSR with Upper/Lower Decay and Release separation. While ADSR mode works as expected, Legacy mode enacts the 'continuous decay' of the hardware, which never becomes particularly intuitive but is certainly capable of creating some intriguing shapes.

Filter frenzy

The bottom half of the main interface houses PolyM's three main filter sections and the Mode filterbank. First and perhaps foremost, the Polymoog's inaccessible 12dB/octave polyphonic 'brightness' filter has been opened up for editing, with adjustable type (low-, high-or band-pass), cutoff, resonance, amount, key tracking and ADSR envelope.

After that, the 'main' global filter is a 24dB low-pass zero-delay feedback, self-oscillating ladder model, modulated by an LFO, a sample and hold generator and an ADSR envelope. It can be restricted to the Upper or Lower keyboard range if required.

The central array of blue buttons call up all eight original Polymoog presets ('Piano', 'Organ', 'Vibes', 'Brass', etc) plus 'Vox Humana' from the Polymoog Keyboard (as famously used by Gary Numan in *Cars*), each of which has an associated uneditable polyphonic internal 'Mode' filterbank configured to mimic the named instrument. With the bottom right button depressed, however, switching preset only changes the Mode setting, bringing its particular colour to any patch (the *actual* preset library is accessed via the top bar menus, of course).

The Resonators section is decidedly unusual. A three-band parametric filterbank originally used for acoustic instrument emulation – ie, formant shaping – it operates in low-, high- or band-pass modes, at a 6dB or 12dB/octave slope, and is once again applicable to the Lower, Upper or both oscillators/ranges.

The four filtered outputs – Direct (Polyphonic VCF), Direct+VCF, Direct+Mode and Direct+Resonators – are mixed in the Master

PolyM includes a bank of four very useful effects

Advanced Settings

Like any vintage synth emulation worth its salt, PolyM adds significantly to Moog's original (40-year-old!) formula. The polyphonic filter, described in the main text, is a big deal, but there's also a comprehensive modulation scheme and a quartet of effects, both revealed in the two-page 'CRT' strip at the top of the interface by clicking the oscilloscope, bottom left.

The Modulations panel features 15 source/destination pairings. The first three source slots are hardwired to pedal/aftertouch, mod wheel and velocity, while the other 12 give free access to PolyM's various integral LFOs and envelopes, and the expected MIDI messages – mod wheel, velocity, note pitch, pitchbend, polyphonic pressure, etc. The destination menu contains the majority of controls for the oscillators, filters, mixer, envelope and effects.

Switching to the Effects page brings up the controls for PolyM's bolted-on Reverb, Delay, Chorus and Phaser modules. Each one is fronted by a set of editable parameters, including three Reverb Size options, separate Left/Right Time and Feedback Delay controls, Phaser overdrive, and two Chorus 'thickness' settings. All four are very useful, but the phaser and chorus are the highlights, with their splendidly analogue sounds.

A massive library of factory and artist presets is included, navigated using XILS' proprietary filters

Gain Controls section, and it's this blending of filter-modulated signals that's key to PolyM's individuality. The ability to modulate the Resonators (see *Advanced Settings*) is huge in this regard, but factor in modulation of their four level faders, too, and all kinds of strange and ear-catching resonant interactions become possible.

Pretty Poly

Like XILS-Lab's other vintage emulations, PolyM feels almost corporeal in its authenticity and vibe. It's refreshingly different, too, with a programming ethos that, although limited in some respects (the oscillators) is remarkably extensive in others (the filters and mixer). The 'divide down' architecture gives it a voice all its own, and the keyboard splitting concept makes it both weird and entertaining to program and play. The addition of effects and advanced modulation routings lends it far more power than its analogue ancestor, and our only beef is that the GUI is quite fiddly in places when running on a high-res laptop screen.

Excelling at pads, strings, keys and other sounds that benefit from being imbued with complex movement, the wacky but wonderful PolyM not only brings Moog's 'curate's egg' of a synth back to life, but greatly improves it. **cm**

Web www.xils-lab.com

Alternatively

GForce Virtual String Machine cm122 » 9/10 » £80
The Polymoog features among the 17 classic multisampled synths in this lavish package

AfroDJMac Polymoog Ableton Live Pack NA » NA » $10
30 Instrument Racks for Live, made from a sampled Polymoog 80a

Verdict

For Very characterful sound
Groovy mixable filters
Split keyboard for many parameters
Extra modulation and effects
Brilliant for strings and pads

Against GUI needs a 'big' mode
Not the most versatile oscillators

With its bonkers architecture and idiosyncratic sound, PolyM is a fantastic addition to the vintage soft synth pantheon

9/10