Wavetable synthesis is inextricably linked to PPG and Waldorf's lengthy lineage of Wave synths. Jonathan Miller says hello, waves goodbye and says hello again...

IS IT REALLY 19 years since Depeche Mode stormed the charts with their latest slice of bubblegum synth pop. See You? This song's catchy bell-like motif and unusual middle-eight tones represented my initiation into the world of wavetable synthesis, courtesy of a PPG Wave 2. But what's the Wave's history? The PPG (Palm Productions GmbH) name dates back to 1975 when German electronics wizard Wolfgang Palm began manufacturing little-known analogue synths. For Palm, the future was digital and it wasn't long before legendary German electronic trailblazers Tangerine Dream came knocking on his door looking for new sounds. With the Tangerine financial assistance, Palm began experimenting with all-digital synthesizer designs, culminating in late 1978 with the PPG Wave Computer 360.

Think different

The 360 certainly sounded different. Instead of relying on VCOs (Voltage Controlled Oscillators) with a few static waveforms, Palm created digital 'oscillators' using 64 short, eight-bit sampled waveforms, groups of which could be swept from one to the next (a wavetable in PPG-speak). And 32 such wavetables on the 360 equalled 2,048 waveforms so a filter was deemed unnecessary.

The 360 Wave Computer soon mutated into the eight-voice 340/380 System, comprising three weighty 4U rackmountable units (the 340 Wave Computer's processor and generator, and 380 Event Generator) plus a computer terminal and five-octave keyboard for sequencing. But something was amiss. The technical limitations of the time prohibited incorporating a digital filter into the Wave Computers so they sounded somewhat brittle and harsh, not a popular trait in an age of analogue warmth. What to do? Quite simply, Palm backtracked a little, feeding his beloved digital waveforms into a VCF (voltage-controlled filter) and VCA (voltage-controlled amplifier) and thus, in 1981, the PPG Wave 2 was born.

Rhapsody in blue

This time the music industry sat up and took note, for the eight-voice, single-oscillator PPG Wave 2 sounded and different sounds. When combined with the newly launched Waveterm B it became the heart of PPG's Music Computer System (with the 8U rackmountable Waveterm offering eight-bit user sampling, DIY wavetable creation and more extensive sequencing capabilities).

MIDI's arrival, later in 1982, revolutionised the electronic musical instrument world; gear from rival companies could now be connected. Yet PPG's proprietary eight-bit parallel communication bus connecting its Music Computer System was already much faster than MIDI! In 1983 PPG beefed up this system to include the EVU (Expansion Voice Unit), a new 12-bit, eight-part multimbral Wave squeezed into a 4U rackmountable casing.

Turning tides

PPG finally joined the MIDI masses in 1984 with the Wave 2.3, effectively a repackaged EVU in the now familiar keyboard casing. 1985's updated Waveterm B boasted 16-bit sampling and 24-track, multimbral sequencing (by connecting a 2.3 and a couple of EVUs). Yet the technological tide was turning on PPG.

Unable to compete against an influx of cheaper, mass-produced Japanese and American instruments, the company finally bit the dust in 1987, but not before selling around 700 Wave 2.3s, 300 2.2s and 300 Waveterns and coming up with some quite remarkable innovations like 1986's unreleased Realizer (quite possibly the world's first virtual instrument). However, the Wave story doesn't stop there.

Palm's next development was a custom wavetable chip, first utilised on the Waldorf Microwave spectral wavetable synthesiser in 1988, a cost-effective, 2U rackmount with real-time parameter access via MIDI. The Microwave was a resounding success and its offspring still forms the cornerstone of Waldorf's product line today. 1997's 10-voice (expandable to 30) all-digital Microwave II has only recently been discontinued.

New waves

In 1998 Waldorf transplanted the Microwave II's guts into the Microwave XT (FM77, 78%), a bright orange desktop-top/5U rackmountable unit sporting 44 knobs. And the Microwave XT, released last year, brought a four-octave, velocity-sensitive keyboard into the equation; proof that longevity does indeed exist in the cut-throat synth world.

And if proof were needed of the bigger, better maxim then look no further than Waldorf's mighty Wave, the 'advanced modular wavetable synth'. It had more voices (16, expandable to 32 or 48), more patches (512) and a monstrous front panel (and asking price). If finances are tight, anyone craving a taste of the infamous PPG sound at roughly a 50th of the cost of the original Wave 2.3 could always grab a copy of Steinberg/Waldorf's PPG Wave 2.V software.

Unlike its hardware forefather, this VST Instrument plug-in's polyphony depends solely on the host computer's CPU power (up to eight 64-variable instruments, each with eight-part multimbralty, can be simultaneously opened). And so, the Wave lives on...
No. 3: PPG and Waldorf Wave series

**PPG WAVE COMPUTER 360**
A rare 1978-vintage all-digital synth, available as either four-voice (360A) or eight-voice (360B), with one oscillator per voice, 32 wavetables and 70 patch memories.

**PPG EVU**
1983’s 12-bit, eight-voice, eight-part multitimbral ‘Wave-in-a-box’ (MIDI was added later).

**PPG WAVE 2**
1981’s first incarnation of the classic Wave, an eight-voice, 32-wavetable hybrid synth with 24dB/octave low-pass filter and onboard real-time digital sequencer.

**PPG WAVE 2.2**
An updated Wave 2 with two oscillators per voice. Its original 1982 list price was $8,800. Today you could be looking at between £200 and £1,000 second-hand.

**PPG WAVE 2.3**
While physically identical to the Wave 2.2, under the bonnet is essentially a MIDI keyboard version of the EVU. At $10,000 on its 1984 release, it was later discounted to around £4,500 as PPG struggled against the mass-produced competition. Current second-hand asking prices could be anywhere up to £1,300.

**STEINBERG PPG WAVE 2.V**
This soft synth is essentially a PPG Wave 2.3 recracked in software form as a VST Instrument plug-in for a mere £149!

**PPG 340/380 SYSTEM**
Hot the heels of the Wave Computer 360 (and looking more like an industrial computer than a musical instrument), this multi-component, eight-voice digital wavetable synth featured a bewildering array of connections and didn’t sell well.

**WALDORF MICROWAVE**
The first Wave for the masses, this neat 2U, eight-voice, eight-part multitimbral, 32-wavetable rackmount arrived in 1988 at a respectable retail price of £999. An £80-odd upgrade in 1995 doubled that onboard wavetable count to 64.

**WALDORF MICROWAVE II**
In 1997 the long-running Microwave was finally redesigned and reborn with 10-voices, 64 ROM Wavetables, 32 RAM Wavetables and a digital filter. Its price? Still £999.

**WALDORF WAVE**
Launched for £4,995 back in 1992, the Wave includes a 76-note keyboard and ‘pick-your-own’ colour schemes. Quite literally an über-wave plaything for the rich and famous, if you have to ask the price then you probably can’t afford one.

**WALDORF MICROWAVE XT**
The bright orange Microwave II rack was released in 1998 and costs £1,999.

**WALDORF MICROWAVE XTk**
The keyboard version of the XT, came out last year and costs £1,449.

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*With thanks to Paul Maddox (www.wavesynth.com), who helped us source the PPG Wave 2.2 samples on the cover CD (track 7)*