

# Retro Family Tree

**CD TRACKS 6-11**  
A selection of copyright-free samples from PPG and Waldorf Wave synths past and present.

✧ **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 Tangs financial assistance, Palm began experimenting with all-digital synthesizer designs, culminating in late 1978 with the PPG Wave Computer 360.

## FAMOUS USERS

Tangerine Dream founder Edgar Froese put the PPG Wave Computer 360 through its musical paces on his 1979 solo album *Stuntman* while the PPG Wave 340/380's most famous advocate was Thomas Dolby.

Here's a brief rundown of those who rode the Waves: Art Of Noise, Depeche Mode, Trevor Horn, Jean-Michel Jarre, Gary Numan, Propaganda, Rush, Stock Aitken & Waterman, Tangerine Dream and Ultravox.

Waldorf's upmarket Wave has found favour with the likes of Tori Amos, Eat Static, The Orb, Underworld and Hans Zimmer while Nine Inch Nails' Trent Reznor has used all the Microwaves at one time or another. And Depeche Mode are also using the PPG Wave 2.V soft synth.



## 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 wavetables 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



✧ **The Wave 2.3 and Waveterm B, the heart and brain of PPG's Music Computer System**

looked the business. The five-octave keyboard is housed in a large black metal case with a blue sloping control panel split into self-explanatory halves: the 17-knob 'multiple-function analogue control panel' and 'multiple-function digital control panel' with its LCD screen.

With two oscillators per voice, the Wave 2.2 could simultaneously play two

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 Waveterms 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 synthesizer 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.

✧ **"The Microwave was a resounding success; its offspring still forms the cornerstone of Waldorf's product line today"✧**

different sounds. When combined with the newly launched Waveterm A 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 buss 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 multitimbral 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, multitimbral sequencing (by connecting a 2.3 and a couple of EVUs). Yet the technological tide was turning on PPG.

## New waves

In 1998 Waldorf transplanted the Microwave II's guts into the Microwave XT (FM77, 78%), a bright orange desktop/5U rackmountable unit sporting 44 knobs. And the Microwave XTK, 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 is 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-voice instruments, each with eight-part multitimbrality, can be simultaneously opened). And so, the Wave lives on... **FM**

# 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 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.

## 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 EVU



1983's 12-bit, eight-voice, eight-part multitimbral 'Wave-in-a-box' (MIDI was added later).

## PPG WAVETERM A



A dedicated (Motorola 6809 microprocessor-based) music computer offering Wave 2.2 users eight-bit user sampling, wavetable creation and fancy (by 1982 standards) sequencing options, all for \$10,650 (approximately £7,500). Just look at those eight-inch floppy disk drives!

## 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 WAVETERM B



The last PPG product to be commercially released (in 1985) at a cost of \$11,995 (approximately £8,000). 5.25-inch disk drives, 16-bit sampling courtesy of an improved Motorola 68000 microprocessor (transferable to the Wave 2.3 in compressed 12-bit) and even fancier 24-track sequencing was the order of the day.

## 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.

## WALDORF MICROWAVE



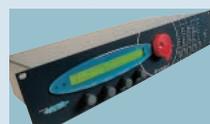
The first Wave for the masses, this neat 2U, eight-voice, eight-part multitimbral, 32-wavetable rackmount arrived in 1988 at a respectable retail price of £999. An £80-odd upgrade in 1995 doubled that onboard wavetable count to 64.

## WALDORF 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 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.

## STEINBERG PPG WAVE 2.V



This soft synth is essentially a PPG Wave 2.3 recreated in software form as a VST Instrument plug-in for a mere £149!

## WALDORF MICROWAVE XT



The bright orange Microwave II rack was released in 1998 and costs £1,099.

## WALDORF MICROWAVE XTk



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