

# Ondes Martenot

As a frail mademoiselle she strides gracefully and lasciviously from one tone to another. With an elegance and sensuality you had never heard of an electronic instrument. Timeless as a Citroën DS she waves through the music, lusty and vibrating: Ondes Martenot! That such simple waveforms can sound so beautiful is not at all dependent on those waveforms. No, it's because of the subtle changes of frequency and amplitude of those waveforms. Immediately molded by the musician this creates an unprecedented expression. Linked to a harmonic spectrum that remains static are the typical sound characteristics of the Ondes Martenot.

## Sound generation

Dynamic filters did not exist yet. The sound generation was rather simple compared to the currently available synthesis models. In the Ondes Martenot (1928), the sound generation was realized in a similar way as in the Theremin.

In both instruments an audible tone is generated by non-linear mixing of two ultrasonic sine wave oscillators. Two new frequencies then arise: the sum and difference frequencies of both. By tuning one of the two oscillators over a relatively small width, the difference frequency can comprise the entire audible range.

## Tone forming and controlling

The tuning of one such oscillator was depending due to the distance of a hand from an antenna. Martenot offered two different possibilities to play different pitches.

## Clavier & Ruban

On the one hand the familiar 7-white 5-black keyboard and on the other hand the so-called ruban: a wire that can be moved with a metal ring attached to it for the entire keyboard. You thus have a pitch continuum, similar to a ribbon controller.

But there was more. Martenot was a cellist and of course as such he was familiar with vibrato that you can realize on a string by moving your finger on the string cyclically up and down in the longitudinal direction. A similar kind of vibrato is possible on the Ondes Martenot because the keyboard can move lateral, sideways. When pressed, you can let the keyboard wobble between left and right. The result of that movement determines the pitch modulation, the vibrato.

Apart from this similarity between the string instruments and the Ondes, there is also another shared characteristic. The tone forming in string

instruments is divided over two hands: one for the pitch and one for the pitch.

For the pitch, the Ondes Martenot has a so-called volume button. A large elongated key that can be pressed 2 cm deep determines the amplitude. This button is mounted resiliently, as soon as you release it, it will return to its high resting position.

### **FX processing**

In addition to an amplifier and normal loudspeaker unit, the Ondes also offered beautiful reverb effects in the form of special speakers. One such loudspeaker was provided with a 'sound box' with 2 x 12 tunable strings. The intention is to tune these strings two by two according to the 12 tones in the octave.

This creates a very beautiful acoustic reverberation such as found in the Indian instruments such as sarangi, sitar, dilruba and esraj which also have such resonant strings. Instead of the string resonator there was also a gong resonator available. This developed a typical long decaying metallic reverb.

### **Ondes d'Interface**

After all those beautiful music videos on YouTube by Claude-Samuel Lévine, Thomas Bloch and Jean Laurendeau you want to own such an Ondes or l'Ondéa. An Ondes Martenot implementation for the G2? Well, the basic sound synthesis and timbre is not a problem. The misery starts with the controlling, the input devices, the user interfacing.

Looking back in time to the Ondes Martenot, you will once again get a clear view of the current state of art in synthesizerland with regard to user interfacing. No beautiful ruban with ring for a continuous pitch scale. Ditto nada nothing beautiful volume. No, all those wonderful and beautiful electronics and algorithms are discreetly shielded behind, for example, the pitch bend wheel with annoying dead click zone in the middle. To realize a nice vibrato with this pitch bend wheel is almost impossible.

Normally you're activating the vibrato by means of the modulation wheel: well in fact a LFO takes over the vibrato job. You only control the amount of the vibrato effect. For the volume we can use aftertouch, which often works so badly that it could be called afterswitch. Go ahead, velocity. No, this won't work either because it is an initial controller and not a continuous one.

In short, when I say that it remains a problem in the Midi world, that is still an understatement. There are a few good exceptions: Yamaha's breath controller, Clavia's pitch stick, AKAI's EWI, the continuum fingerboard from Haken. Anyway, all wonderful extras, except for the pitch stick from Clavia. It's included in the Clavia synths

And, as said, looking back in time to the Ondes Martenot, that shows us the way to the future: a user interfacing that is in line with the internal sound

power generation. This was the case with Ondes. The instrument is a challenge. You want to invest time and study because you feel the musical potential.

That is exactly what happened in France a long time ago. Maurice Martenot became lecturer Ondes at the conservatoire national superieur in Paris. His successor Jeanne Loriod was undoubtedly one of the greatest on this instrument. Thomas Bloch, Jean Laurendeau and Claude-Samuel Lévine, current masters, were students of Loriod. Today you still can get Ondes Martenot lessons in France at some places.

## **Ondes G2**

Do I dare to try a synth imitation after all these words? Yes, but it will not be a one-to-one copy. The question is whether you should want that. Modeling the original waveforms as accurately as possible? No, of course I don't. It will be an attempt to capture the essence. That is first and foremost a great nuanced controlling in terms of pitch and volume. And, as a musician, you must do everything yourself. No LFOs and envelope generators etc.

The input devices: modulation wheel and foot controller.

I assume that most of us do not have a breath controller, although it is highly recommended.

So I limit myself to the modulation wheel and the foot controller. The modulation wheel is a lot nicer to use compared to the pitch bend wheel. It has no annoying dead middle click zone.

You can improve the quality of a foot controller considerably by putting one or more elastics on the heel end. The pedal then always returns to its rest position, the off position. Right, then it seems very much like the Ondes volume button.

Remains the string with ring for the continuously sliding pitch. Excusez moi: it will only become a keyboard-ondes. If you have G2 hardware at your disposal, go ahead with Ondes d'Interface.pch2 View and study the sub-patches (can also be opened with the demo software).

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This article was originally published in Dutch as 'Ondes Martenot' in Interface 119 June 2008.

Internet

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