

LaVoixski the Digital Theremin



LaVoixski is a digital musical instrument based on the Theremin. It has the RF oscillation circuits "The heart of the Theremin", but does not have the analog demodulators for produce the audio signals.

The system is programmed by Arduino and is running on the Micro Controller Unit Teensy4.1.

LaVoixski has 5 wavetable oscillators. The 32 wavetables are contained as the text file on the microSD card. The player can modify them by using the math tool like "GNU Octave".

The pitch and the volume values are sensed from the real RF oscillators by "General Purpose Timer = GPT" inputs on the Micro Controller. The detected values control the pitch of wavetable oscillators and its envelopes.

LaVoixski has the several method for mixing the oscillators.

The first method is named monaural / additive synthesis, the oscillators are driven in the same pitch. The player can select any fundamental and harmonic waves for design the total shape of the waveform.

The second method is polyphonic output. The oscillators are driven in the different pitches and any waveforms. The player can select the pitch combinations from the preset data on the microSD or edit the microtonal pitches in The Chord Edit mode.

The third method is the Transition. The mixed audio output has 2 modes, "Normal " and "Transition". In the Transition mode, the output signal levels of the oscillators are controlled by the envelopes in the different phase. (see the section "Transition")

The system has 3 edit modes: Chord, WaveMix and Exciter.

In the Chord Edit mode, the player can edit 4 microtonal pitches in a chord. The 16 edited pitch groups are stored by CSV formatted text files into the microSD card. (see the section "Microtonal tuning / Chord Edit Mode")

In the WaveMix mode, the player can edit the combination of the 5 wavetables with levels. The edited combinations are also stored into the microSD card. (see the section "WaveMix Mode")