

## VCO-6, single voltage controlled oscillator

The VCO-6 is a single voltage controlled oscillator and it has six individual waveforms (see below). The frequency is controlled by manual controllers (knobs) and FM (leveled inputs). The VCO-6 can be sync-ed by an external signals frequency, as well.

### Frequency controllers

The oscillator's frequency is controlled by RANGE (from C2 to C8), TUNE knob ( $\pm 6$  semitones in audio mode and  $\pm 12$  semitones in LFO mode) and leveled FM inputs (DC or AC coupled FM1 and exponential F2 and FM3). Frequency modulation (leveled FM1, FM2 and FM3) determines the intensity of frequency modulation and/or pitch control. The FM2 and FM3 inputs are carefully calibrated for 1Volt/octave sensitivity and it tracks the musical scale for more than 8 octaves.

### Waveforms

The VCO-6 is equipped with six separate waveform outputs. The different waveforms contain different harmonic structures respective to their overtone content. Thus they sound different from each other and can be used as raw material for creating different types of sounds. This is a brief description of waveforms:

\* Sine  contains low order harmonics with low amplitude and sounds "dull" or "pure".

\* Triangle  contains more high order overtones than sine and sounds still "dull" and "pure" but with more "edge".

\* Saw  contains many overtones and sounds "rich" and "cutting". It is especially useful for strings, brass and vocal-like sounds.

Pulse controlled waveforms

The VCO-6 has three different pulse controlled and modulated waveforms:

\* Width modulated saw tooth  which act as a true detuned dual saw tooth oscillator when the PWM1 is modulated with a low frequency signal (preferably a triangle shaped waveform) and the detuned frequency (frequency offset between two detuned saw tooth waves) is equal to doubled modulated signals frequency.

When the PWM1 is modulated with the signal in audio range the pulse modulated saw tooth act as saw tooth ring modulator.

The VCO-6 has two different sounding pulses:

\* Pulse1  and pulse2 . The pulse1's pulse width is controlled by a signal coupled to the PWM1 INPUT and thru switch PW by the manual controller PULSE WIDTH in position 1&2.

The pulse2's pulse width is controlled by the manual controller (knob PULSE WIDTH) and a signal coupled to the PWM2 input. Both pulses can be controlled from square waveform to very short pulses (spikes).

Pulses are symmetrical in the whole range of pulse width and they are different from the "classic" variable pulse which is asymmetrical when the pulse width is not equal to 50% (square waveform). The Pulse1 contain more even harmonics (as saw tooth waveform) and the Pulse2 contain more even harmonics (as square waveform) which results in different sounding signals.

**SYNC** means that sync'ed oscillators frequency is tracked to the frequency of controlling oscillator.

### Performances

Total frequency range controlled by manual controllers and FM signals; 0.01Hz to 22kHz, including LFO mode

### Controls

RANGE 32 Hz to 2 kHz (C2 to C8) in seven steps, 0.2 Hz to 12 Hz in LFO mode

TUNE 12 semitones (AUDIO mode), 24 semitones (LFO mode)

WAVEFORMS pure Sine (1% THD), Triangle, Saw Tooth, "pulse modulated" SawTooth, Pulse1 and Pulse2

FM1 linear FM, leveled, DC or AC coupled

FM2, FM3 exponential FM, leveled form 0 to 1 Volt/octave

### Inputs

PWM1 pulse modulation for pulse modulated Saw Tooth and Pulse1

PWM2 pulse modulation for pulse modulated Pulse2

SYNC sync in, any shape of incoming signal, threshold=2Volts

Current consumption 60mA

Protection protected against reversal voltage

Dimensions 128.4 mm (H), 70.6 mm (B), 3 HE, 14 TE

