

Figure 5.1 Wavetable crossfading. The bold outline traces the amplitude of a note event. Four waveforms crossfade over the span of the event. The numbers at the bottom indicate the sequence of waveforms alone and in combination. Each region indicated at the bottom represents a separate timbre; thus the event crossfades through seven timbres.

sion instrument onto the sustain part of a synthetic waveform. Figure 5.2 depicts an instrument for wavetable crossfading.

The first commercial synthesizer to implement wavetable crossfading was the Sequential Circuits Incorporated Prophet VS, introduced in 1985 (figure 5.3), which could crossfade between four waveforms. Newer synthesizers let users specify an arbitrary number of waveforms to crossfade during a single event (figure 5.4). The crossfading can be automatic (triggered by a note event) or it can be manually controlled by a rotating a joystick, as in the vector synthesis implementations designed by David Smith and manufactured in Korg and Yamaha synthesizers.

Wavestacking

Wavetable stacking or *wavestacking* is a simple and effective variation on additive synthesis. In this method, each sound event results from the addition of several waveforms (typically four to eight on commercial synthesizers). This is done in a different way than in classical additive synthesis. Classical additive synthesis sums sine waves, whereas in wavestacking each waveform can be a complicated signal, such as a sampled sound (figure 5.5).

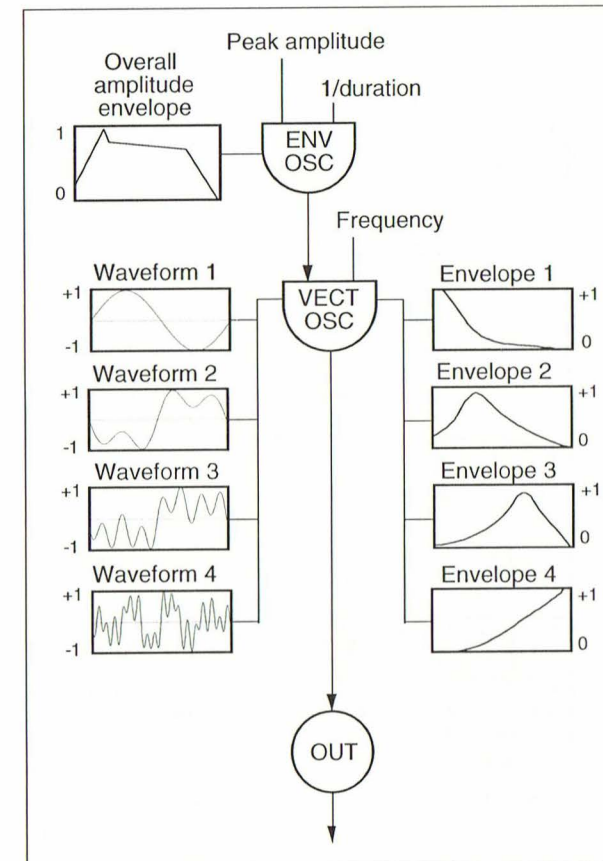


Figure 5.2 Wavetable crossfading (vector synthesis) instrument using four wavetables. Each envelope on the right applies to a wavetable on the left.



Figure 5.3 Prophet VS digital synthesizer made by Sequential Circuits Incorporated (1985).