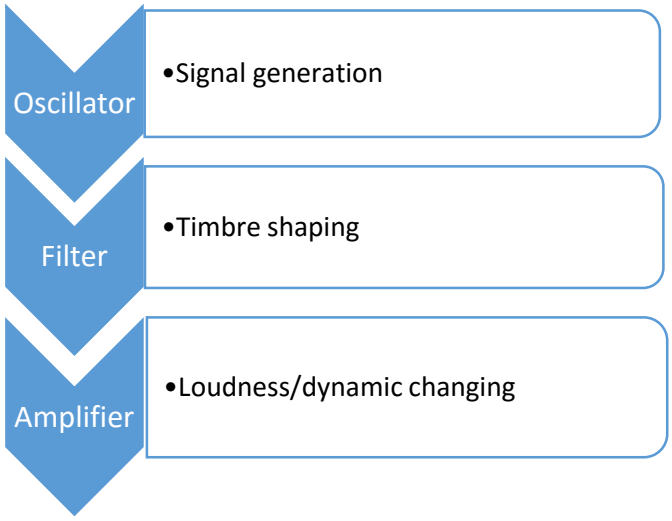
INTRODUCTION TO MUSIC PRODUCTION – WEEK7

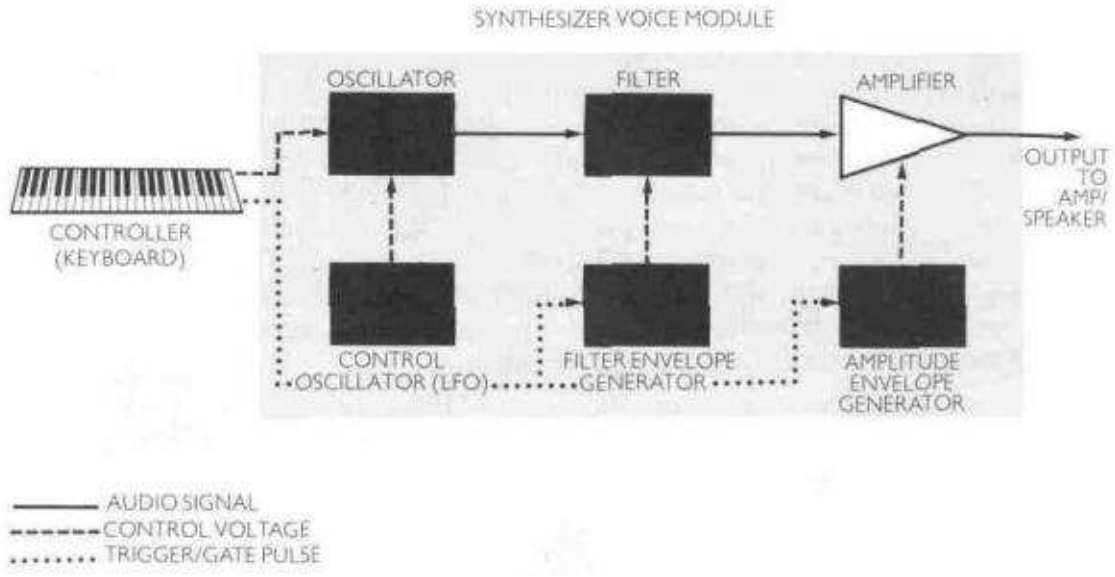
TYPES OF SYNTHESIZER MODULES - BY AKASH KODIGANTI (B. TECH - INDIA)

A synthesizer can be best defined as a device that construct a sound by determining, uniquely and implemented in many kinds of keyboards using monophonic or polyphonic usage. Majority of modern synthesizers are based on subtractive synthesis.

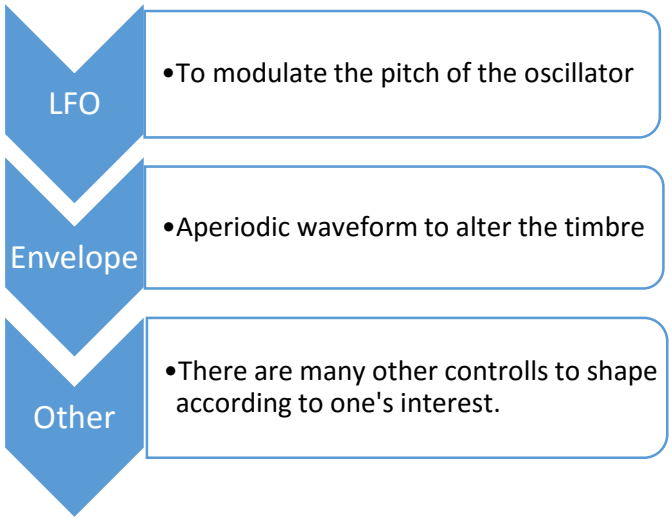
The three elements that design the sound namely – the pitch, the timbre and the loudness are primarily determined by devices known respectively as oscillators, filters and amplifiers.



A synth voice module looks like:



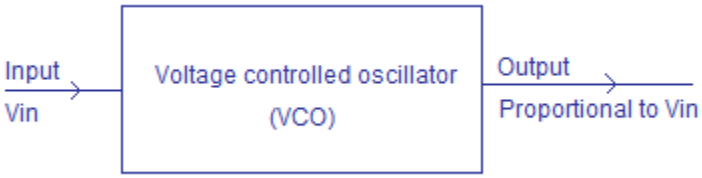
In addition to these three blocks, there are others too. A low frequency oscillator and one or two envelope generators.



1.Oscillators (VCO):

The VCO generates a different pitch depending on the voltage that is applied to it. A voltage is difference in electrical potential.

As there is a greater voltage applied to its input, the faster it will oscillate. Now, the VCO is adjusting the rate of oscillation accordingly.

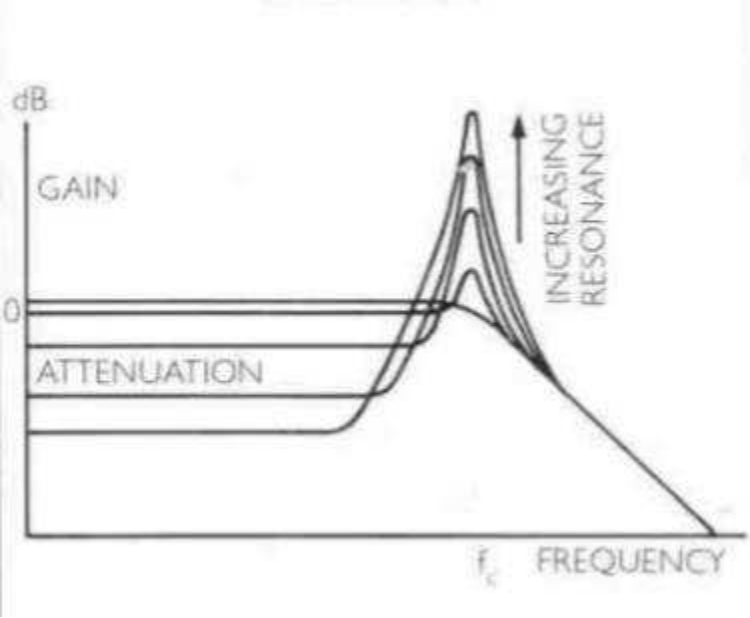


All the controls that available inside the VCO are added together in order to produce a single composite voltage. And is fed to the oscillator which produces a tone pitch proportional to voltage level. This intern can be used to convert the tone in to various waveforms like sine, saw-tooth, traingular etc. Shaping the waveform is of major concern when using VCO.

2.Filters (VCF):

The filter is glorified tone control – to determine the timbre or tone color of the final sound. The treble and bass controls of your record player are simple filters. Resonance is the control that which is associated and is a controlled feedback effect.

Standard filter – the low pass filter and the parameters.



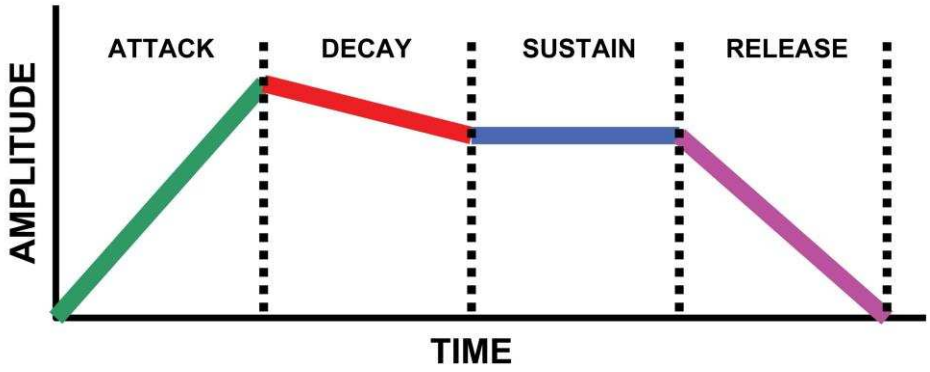
A certain amount of filtered signal (determined by the resonance control) is tapped off and mixed together with the incoming signal. In the zero position, the resonance control will prevent any signal being fed back to the input. Hence, the filter can be used as a signal modifier.

3 &4 .Amplifier & Envelope (VCA):

The sources of aperiodic waveforms in a synthesizer voice module are envelope generators and the white/pink noise generators.

Modulation of the pitch of the note with an envelope control voltage can often be put to a more musical application. It is vital when working with such a setup to be able to set the amount of envelope generation voltage used to sweep the pitch of the note.

The ADSR parameters of the envelope better describes the type of envelope to be used.

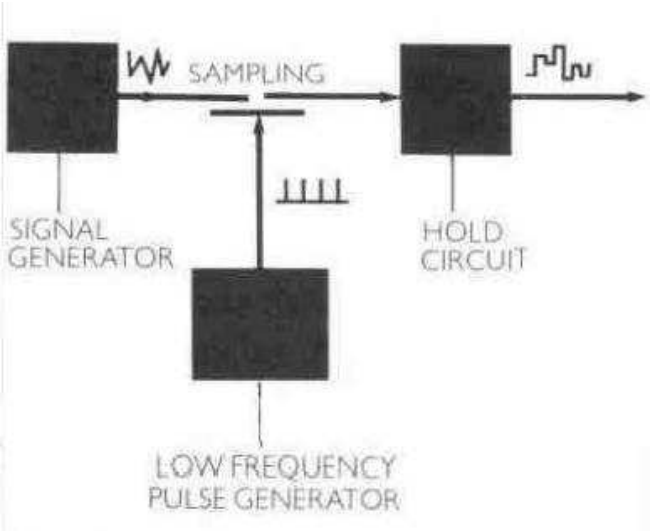


Types of envelopes:

1. Plucking sound or strike envelope – when Decay set to 10-80%
2. Blowing or bowing sound envelope – when Sustain set to 50-90%
3. Quirk sound envelope – when Decay to 30% and Release to 50-100%

5.LFO – Low Frequency Oscillator:

LFOs, are incorporate a non-voltage controlled oscillator which produces a periodic sub audio control waveform for modulation any voltage controlled parameter. Most LFO covers range between 0.2 to 30 Hz.



As the LFO is not voltage controllable, the rate of oscillator is set by a control knob and for a given sound the rate is set normally constant.

LFO helps in making the sine, square or saw-tooth based on controlling parameters with VCO and VCF.

CONCLUSION:

The synthesizer manufacturers are aware that computers are moving into their territory and as a result, they are seeking to facilitate the use of computers with their products.

This development is a logical one so as to ease the job of Music production with the use of synth modules. But getting a clear idea on all the parameters can only benefit in making great music.

NOTE:

I am so happy to be a part of INTRODUCTION TO MUSIC PRODUCTION course and would like to note the below.

The computers specifically, has a major role to play in the design of future instruments and although there will be a demand for a simple preset instrument, the increasingly technical minds of today's musicians will ensure that tomorrow's instruments utilize to the full, the advances that science will bring us.