

## Adam's Synth Tutorial Series: Part 1

A warm welcome to the first part in our tutorial series. Throughout these tutorials, we will learn everything from the synth basics, to creating your own sounds.

These tutorials will be using "Synth1", an excellent freeware synthesizer which is capable of creating a wide variety of sounds. It has many great features and is really easy to tweak, so it is perfectly suitable for beginners and more advanced users alike. You may download it from:

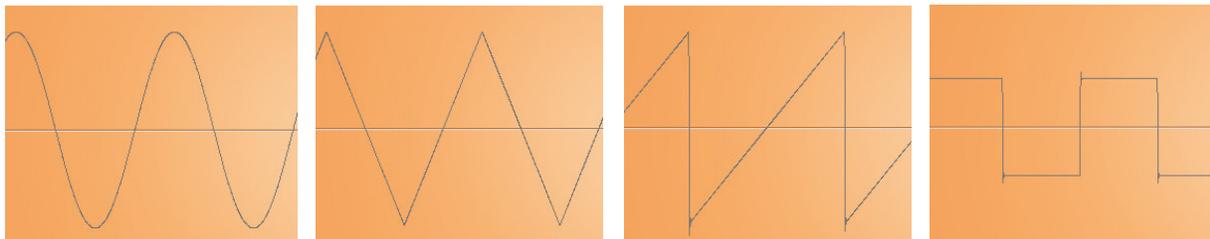
<http://www.geocities.jp/daichi1969/softsynth/>



In order to create our own sounds, we first need to learn what all those knobs are for, what they do, and how a synth works.

The first thing we will look at are the oscillators (the things that generate the sounds). As you know, a synthesizer generates soundwaves through different algorithms. That means, we could make a sine wave, a square or a saw. But do they really have that shape or are they just called like that? We can easily examine our sounds with a fantastic plugin called "s(m)exoscope". It is basically an oscilloscope which means it can show us visually how the sounds looks like. It can be freely downloaded from this address: <http://bram.smartelectronix.com/plugins.php?id=4> (it is a good idea to read through the online manual before you use it).

Load up your s(m)exoscope to the main insert effect so we can see what Synth1 is doing. Now, play a note on Synth1 and try selecting each wave, and play it again. We can see that we get similar shapes:



(sine)

(triangle)

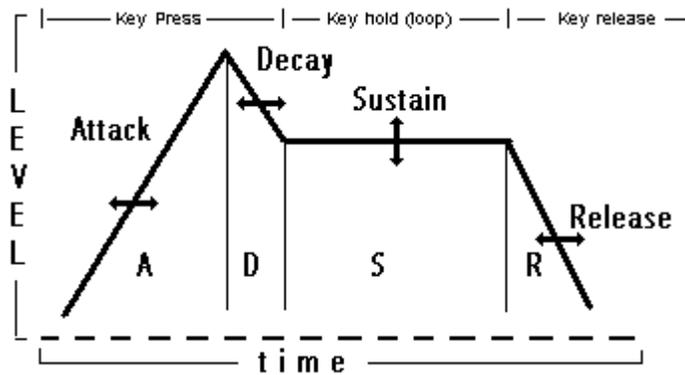
(saw)

(square)

The oscillator symbols weren't lying, and the waveforms that they generate, do look like, like their selection symbol. This is great, because now we know how our different waves looks like, and we can use this knowledge to better understand what sound design is about. If you encounter new sounds you can always check with s(m)exoscope, to visually see what you are hearing.

Now let us look at the waves that we got. As you could hear, the sine and triangle waves were rather soft, and they are usually used for sub basses, which means that they have their power on the lower range of the keyboard. The next one, the saw (and yes, its the trancers favourite) which is a really sharp sound, is great because it can do anything from basses, to plucky sounds, to pads. And last but not least, the square (which you probably heard much of if you played nintendo or gameboy), which can be really great sounding if you play it really low. The square is also very popular in the electro genre.

Now let's leave the sound waves for now, and move on to the Amplifier and Filter sections, which help us shape the sound in different ways.



The Amplifier consists of four main knobs: A,D,S,R which stand for Attack, Decay, Sustain and Release. They basically change the volume of the sound, and with the help of this, one can create pads that are fading in, or sharp plucks.

If we look at the image to the left, we can imagine that the volume of the sound can be represented with the graph. The arrows show what will happen if you turn the ADSR knobs. If you turn the Attack button up, the diagonal line (representing the volume) will

move further away to the right, so it will take a while until the sound reaches its maximum volume. After the Attack, the Decay controls how much the volume should go down, before entering the Sustain section. The Sustain knobs, controls the volume at which the sound will loop until you hold down the key. Basically this section will play over and over until you release your key. After you stop holding and release the key that you pressed, the Release speaks for it self: it controls how fast the volume should fade out. Try experimenting with different ADSR settings. For example try making a pad which is slowly fading in and fading out once you release your key.

Moving on to the filter section, a filter is, as the name says it: "filters" out specific frequencies. There are three controls which are important right now: "frq", "res" and the "type". The frq (usually called "Cutoff" in most synths), is the frequency at which the filter allows sound to pass through. There are three main filter types: High Pass, Band Pass and Low Pass. They are demonstrated in the image to the right. The High Pass will take away the low frequencies (the bass) from the sound and if you turn the "frq" knob while this filter is selected, the filter gets bigger and smaller as indicated by the arrow. The Band Pass is like a little hill, that cuts off sound from both the lower and higher frequencies, which gives an interesting effect. If you turn the "frq" knob when this is selected, the hill will not be bigger or smaller, but will move left to right. The Low Pass is the opposite to the High Pass, and it only lets through the bass, and is used to slowly bring in a sound. And last, the "res", known as Resonance, simply emphasizes the filter amount. However, watch out with this knob, because too much can give very harsh sounds, and may not be very good for your ears/speakers.

FILTER TYPES		
High Pass	Band Pass	Low Pass

This was the first part in our series, and you have learned what the different waveforms look like, what the ADSR means, and what the filter does. Experimenting is the best way to learn, so for now, play with the settings and try to recognise the sound of each waveform, which will come in handy when making your own sounds.