

# A Short Intro to MIDI and VST

## MIDI

MIDI stands for Musical Instrument Digital Interface. It is a standard that allows electronic musical devices to communicate with each other. MIDI is a very simple protocol which is well integrated into PC and Mac technology.

## MIDI Keyboard

A MIDI keyboard allows you to play live on (other) MIDI devices. MIDI keyboards come in many different sizes and prices. The easiest to implement are those that support USB. Providing you have the latest operating system (at least Windows XP in case of a PC) it is just a matter of plugging them in, i.e. you would (normally) not need to install drivers. Prices for a small keyboard start at around £35 and go up to £thousands for high end models. Using a USB MIDI keyboard removes the need for using a MIDI interface, and allows you to play MIDI instruments devices.

## LATENCY

This is the delay between the moment you press a key on your MIDI keyboard and when you hear the sound. There is always some latency, but when using ordinary (built-in) sound cards in your computer (especially PCs) you may find that this delay may become considerable and annoying if not unworkable. Most audio or MIDI software allows you to tinker with the sound buffer settings to get the best balance between sound quality and latency. A latency of more than 15ms is normally deemed annoying, anything beyond 30ms becomes "unplayable". One option to reduce latency is by getting an ASIO compatible soundcard or to download and install ASIO4ALL (see below).

## ASIO

ASIO (Audio Stream Input/Output), developed by Steinberg, is a cross-platform, multi-channel audio transfer protocol that is being adopted by many of the manufacturers of audio and MIDI applications. It allows software to have access to the multi-channel capabilities of a wide range of powerful sound cards.

ASIO expands on the basic capabilities of a standard computer soundcard, most of which can only provide stereo (two-channel) audio input and output. The ASIO specification defines the interface that manufacturers of professional audio soundcards must use to create an ASIO driver for their hardware. This driver allows the audio or MIDI application to "see" all of the inputs and outputs available on the sound card. The user can then assign these ports as needed for recording or playback when using an ASIO-compatible software program. A benefit of this is a major reduction in latency.

## **ASIO4ALL**

ASIO compatible soundcards tend to be expensive. If you don't want to fork out £100+ for one, you can also try using ASIO4ALL software which you can download at [www.asio4all.com](http://www.asio4all.com). This software is free and when installed emulates ASIO capability for your built-in (non-ASIO) soundcard. All you need to do to use it is choosing the ASIO4ALL driver as the audio output channel when configuring audio or MIDI software on your computer.

## **MIDI interface**

Allows you to connect MIDI devices to your computer, such as keyboards that have MIDI but no USB. Often MIDI interfaces are integrated on soundcards that can either be internal or external (via USB). You don't need a MIDI interface if you have a USB MIDI keyboard and are only expecting to play instruments on your computer. I use a Tascam US-122L for more serious MIDI work, which is also an ASIO compatible external soundcard.

## **MIDI Files**

These are files that contain a MIDI sequence including instructions for which instruments to be used and what settings to use. They can be played using a MIDI Player. Even the Windows media player can play MIDI files. By default it uses the instruments on your soundcard, but you can also route the MIDI signals from the MIDI player to other instruments on your computer (see VST) or that are connected (via a MIDI interface) to your computer. A quick search on Google will tell you that there are millions of MIDI files freely available on the internet.

## **MIDI Sequencer**

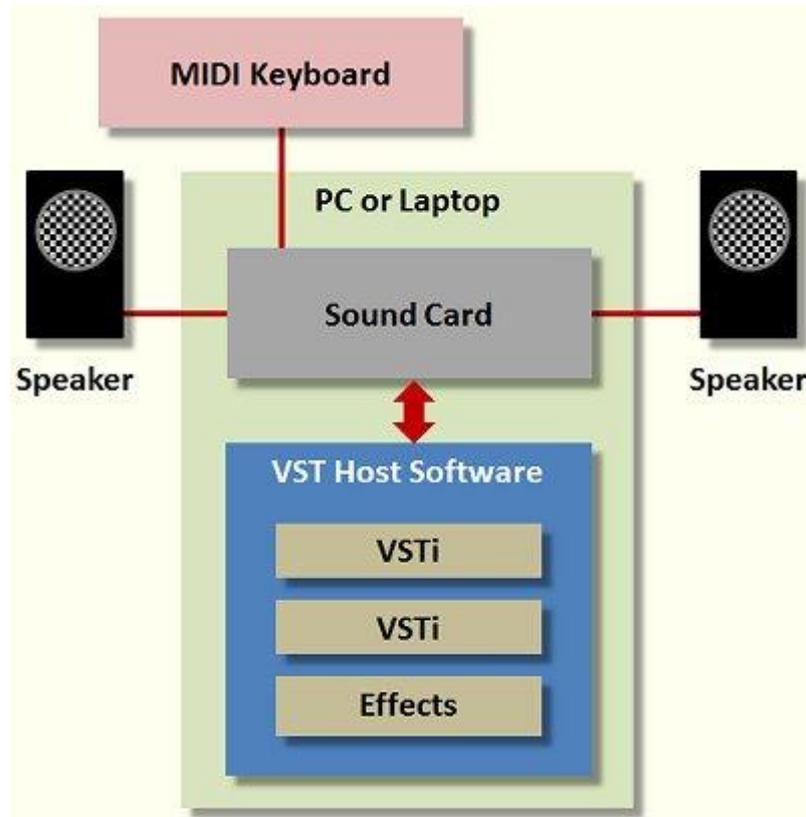
Is a piece of software that allows you to record, create or edit MIDI Sequences and then save them in MIDI file format or as a sound file. They often work like old fashioned multi-track recorders, i.e. you can record one MIDI track and then dub another one while listening to the first one. Most of them also allow you to create music graphically either putting notes on a staff or, more commonly, through a so called piano roll. This example below is one of a number of freeware sequencers available on the web. It appears to be quite complete: <http://www.frieve.com/english/musicstd/musicstd.html>.

## **VST**

VST (Virtual Studio Technology) is also developed by Steinberg and basically extends MIDI to include computer based musical instruments and effects as well as multitrack recording and mixing capability. A VST compatible musical instrument is sometimes referred to as a VSTi plugin. Other VST plugins add effects such as reverb or chorus, etc. In order to use any VST plugins, you need a host to run these plugins on. The simplest freeware host is by Herman Seib, which you can download here: <http://www.softpedia.com/get/Multimedia/Audio/Other-AUDIO-Tools/VST-Host.shtml>.

MIDI Sequencers, such as the one mentioned in the previous section, have often VST capability built in. There are thousands of free VST plugins available on the internet. A good selection can be found here: <http://www.vstplanet.com>. How to install VST plugins depends on the host software, so you need to follow the instructions that come with the host (not those that come with the VST plugin). Some of my most favourite free VST instruments include MiniMogue VA, which can be found here: <http://home.no/gunnare>, which comes complete with a host, so is more or less standalone!

In the diagram below you can see an example of a setup using MIDI and VST.



## CREATING YOUR OWN VST PLUGINS

If you don't like the ones available on the internet, it is possible to build your own VST plugins. There are various free and pay-ware applications available that will allow you to do this. My favourite is SynthEdit. This software not only creates VST instruments and effects, you can also use it standalone or as a means of creating all sorts of sound effects. For more information check out the website on [www.synthedit.com](http://www.synthedit.com).

Maarten de Vries

Member of the T-Exchange. [www.t-exchange.net](http://www.t-exchange.net).