PROGRAMMING ENVIRONMENTS

AoS1: SOFTWARE AND HARDWARE

What is MIDI?

- The acronym **MIDI** stands for **Musical Instrument Digital Interface**
- Devices would communicate with one another through **MIDI messages**
- MIDI also paved the way for **virtual instruments** to be widely used

The History of MIDI

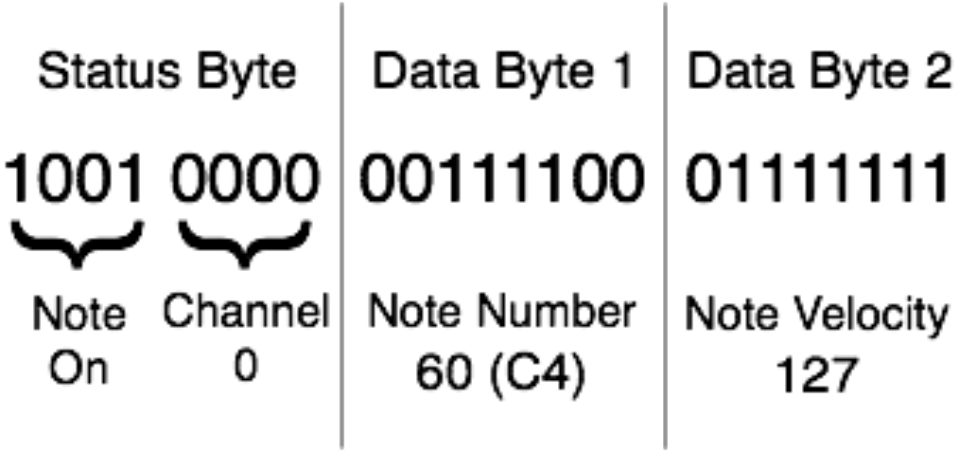
- Before the invention of MIDI, different manufacturers used **different protocols** for their instruments

- Genres such as 80s pop were characterised by **many layered synth sounds** and MIDI allowed for these sounds to be controlled from a **single keyboard**

- Many popular manufacturers collaborated on the creation of the MIDI protocol

MIDI Messages

- MIDI works by sending **binary messages** between devices on different **channels**
  - **Status byte** = Type of MIDI message
  - **Data bytes** = Parameter information
- Status bytes always have an **MSB** of 1and Data bytes always have an **MSB** of 0
  - MSB = Most significant bit
- Because the audio is created using encoded messages rather than acoustic waveforms it is possible to change the sound of a recorded track after the fact



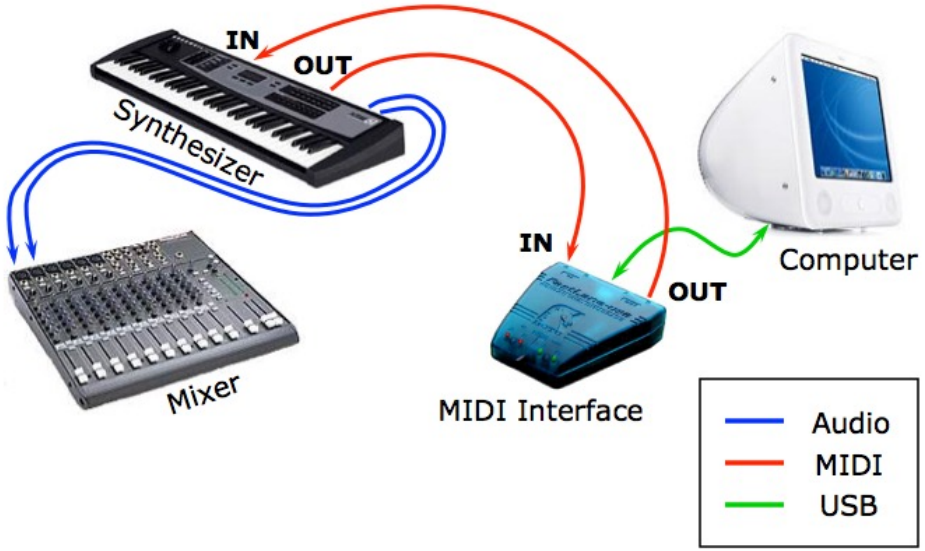
MIDI Controller Changes (CC)

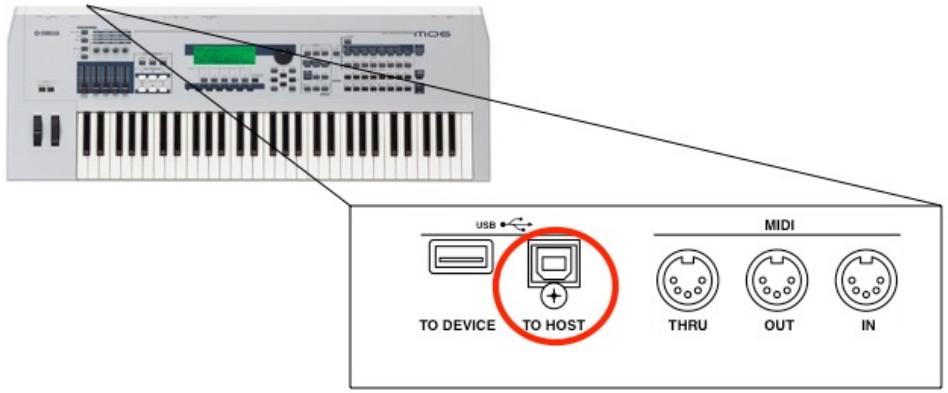
- MIDI controllers allow for messages about the values of specific parameters to be sent and received
- They can either be **switched** (on or off) or **continuous** (a value between 0 and 127)

Controller Number	Controller Name	Switched/Continuous
1	Modulation	Continuous
7	Volume	Continuous
10	Pan	Continuous
11	Expression	Continuous
64	Sustain	Switched
65	Portamento	Switched
121	Reset all	Switched

MIDI Setups

- More **traditional** setups containing **hardware** synths are still used and are actually beneficial in live scenarios
- When using a hardware synth, **MIDI cables** are used to connect it to a **MIDI interface** which can then connect to a computer using a **USB cable**
- Nowadays, it is common for **'MIDI keyboards'** to be used in conjunction with software-based synths
- Modern keyboards have a USB port that allows for direct connection to a computer, eliminating the need for a MIDI interface





Open Sound Control (OSC)