



AUDIO HARDWARE

AoS1: SOFTWARE AND HARDWARE

What is audio hardware?

- Any device capable of **generating**, **receiving** and/or **processing** audio signals
- The main types of audio hardware are:
 - Transducers
 - ADC (Analogue to Digital Converters)
 - DAC (Digital to Analogue Converters)
 - CODEC
 - ADC and DAC combined
 - DSP (Digital Signal Processors)



Audio signals come in both analogue and digital forms

transducers - convert one type of energy into another

Microphones – ADC (encoding)

Loudspeakers – DAC (decoding)

Audio Interface – CODEC

DAWs - DSP

Microphones

- An example of an **ADC**
- They **convert** the air pressure variations caused by sound into an **electric voltage**
- The resulting voltage is converted into **binary code**



Conversion is carried out via electromagnetic induction

Pre-Amps

- Convert **lower level** signals to **line level**
 - Gets the signal ready for further processing
- Most audio interfaces will come with built-in preamps
- Higher quality external preamps can help to **increase** the overall **quality of the signal**



Microphones and instruments aren't at a high enough signal level to be processed on their own

Audio Interfaces

- Audio interfaces are capable of both **encoding** and **decoding** audio
- They can **convert** mic and instrument signals to a **digital format** for DAWs
- They can **route digital audio** from a DAW out to **headphones** and **studio monitors**



DI (Direct Injection) Boxes

- Used to capture electric/electronic instruments **without the need for a microphone**
- Can route **directly** to an **audio interface/mixer**



Mixing Desks

- Used to **mix audio signals** from microphones, electric/electronic instruments and/or recorded sounds
- Digital mixers are examples of **DSP**



The controls on an analogue mixing desk are similar to those you would find in the channel strip of a DAW

Outboard Effects

- Used to alter an audio signal separately from a mixing console/DAW
- Used both live and in studios
- Examples include
 - EQ units
 - Dynamic processing units
 - Time-based effect units



Dynamic processing: compression, limiting, gates

Time based effects: reverb, delay, flanger, chorus, echo