BASICS OF MASTERING AND PRODUCTION

Compression

Compression is used to limit the **dynamic range** of an audio signal. That is, it is used to attenuate loud sounds and amplify quiet sounds. Most compressors will have the following variables:

- **Threshold**: This is the amplitude at which the compressor begins to attenuate the signal.
- **Ratio**: This is the amount of gain reduction applied. e.g. a ratio of 1:1 will result in no attenuation, while a ratio of 60:1 will result in extreme attenuation of the audio signal (see Limiter).
- **Knee**: This sets whether the compressors response to the audio signal is gradual or abrupt. The **Knee** is often described as either:
  - **Hard Knee**: No gain reduction is applied until the amplitude reaches **the** threshold, at which point the gain reduction is immediately applied. This can result in very abrupt changes.
  - **Soft Knee**: Gain reduction is gradually applied as the amplitude approaches the **threshold**. This results in a far more gradual changes.
- **Attack**: This sets how quickly the compressor reacts to audio signal reaching or approaching, if using a **soft knee**, the **threshold**.
- **Release**: This sets how quickly the compressor reacts to audio signal dropping back below the **threshold**.
- **Input Gain**: This increases the level of the input, pre-compression, thus allowing you to bring the amplitude of the audio above the **threshold** before subsequently attenuating the signal.
- **Make-Up Gain**: This increases the level of the output, post-compression, thus allowing you to bring audio the compressed signal up to a desired level.
- **Look-Ahead**: This delays the incoming signal, allowing the original input to be used to drive the compressor while the delayed signal is actually compressed. This allows much smoother, more gradual compression, but obviously the resulting audio is delayed...

Some common Compressor types:

Limiter

A Limiter is a special case of compression, with a high **ratio**. Limiters are used to ensure that the amplitude **never** rises above a certain **threshold**.

Warning: This can result in distortion...

Side-Chain Compression

Side-chain Compression involves using the amplitude of one signal to reduce the signal of another - i.e. when the amplitude of Signal B rises above the **threshold**, the amplitude of Signal A is reduced.

Multi-Band Compression

A Multi-Band Compressor allows you to compress different **frequency bands** separately.

Some General Mastering/Production Tips:

- While compression can really help to make an audio signal sound louder and fuller, the resulting decrease in dynamic range should not be over-looked, and can often result in music sounding "flat."

  As such you should try to use compression sparingly - a good mix of volume levels is generally more effective than a heavily compressed audio file. This is true of both using compression on individual audio tracks, and using compression when mastering.

- There are no hard and fast rules for compression and ultimately it comes down to personal taste in many cases, but as a general rule:
  - Settings which result in **abrupt** amplitude changes (e.g. fast attack, high ratios) are best suited for use with percussive sounds (e.g. drums).
  - More **gradual** amplitude changes are more suited for use with sounds with softer attacks.

- Mastering should only be done **after** your track is completed! In other words, you should have your entire piece **mixed** as best you can before you start thinking about mastering.

- When mastering **always** work in a **new** *Logic Pro* project/file! Export or bounce your entire project as a single audio file and bring this into the new project. Only when you are working in a new project, with only the one audio file, should you begin mastering.

- **Take regular breaks** when mastering - the ears very quickly become fooled into thinking that what they are hearing is perfect, by taking regular breaks (i.e. going outside for a walk) you will be able to listen much more critically.

- **Never** mix or master using headphones! But, **always** listen to your mix/master on multiple **different** sets of speakers and headphones!