Lesson 13

Signal Processing, Dynamics-Based: Volume Control Q & A

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1. A virtual downward fader may be called a _compressor_ . (page 492)

2. The _threshold_ is when the compressor starts working (page 492)

3. The _input gain_ ~~ratio~~ determines the amount of volume control being applied to the sound. (page 493)

4. If a compression ratio is 10:1 or larger, which means that the compressor is more active, that compressor is called a _limiter_ . (page 498)
   ratio

5. If a compressor's ratio is set to 100:1 or infinity to 1, that compressor is now a _clipper_ . (in this _limiter_ lesson in this manual)

6. Limiting is used to prevent _overloading_ or sounds that exceeds a certain _peak level_ . (page 499)

7. In order to reduce a sound like "ssss", or sibilance, a special compressor called a ~~frequency selective compression~~ _de-essers_ may be used. (page 495)

8. A processing device that makes loud signals louder and soft signals softer, or the opposite of a compressor, is called an ~~frequency selective compression~~ _expander_ . (page 500)

9. A device that softens a sound after it falls below a set level is called a _noise gate_ . (page 501)

10. The _release_ control on a noise gate determines how far a gate will close. (page 501)

11. The _release time_ control on a noise gate determines how fast a gate will close (in this lesson in this manual).

12. _Output gain_ enables a sound to be made significantly louder (apparent loudness) in a mix by controlling the volume. (page 493)

13. _Limiting_ is used so that a recording can be made at a high level without overloading the electronics, due to loud sounds. (page 498-499)

NOTES:

Dynamics is the range of sound from the quietest to the loudest volume; Dynamics process alter an audio signal based upon its frequency content and amplitude level

The 4 most common dynamic effects are compressors, limiters, gates and expanders; special purpose processors: AGC units, duckers, de-essers, levelers, feedback suppressors, exciters and enhancers

A compressor is a device in which signal gain decreases as input level is increased; This reduction occurs at or above a set point called a threshold

A limiter is a compressor through which most of the output level is not allowed to go over a set threshold; Limiter ratios are usually at or above 10:1 and are often used to reduce occasional peaks

A clipper limiter is a compressor through which no output level is allowed to go over a set threshold; The clipper limiter ratio is usually between 100:1 and infinity:1

Too much compression can make it sound as though the sound is "pumping"

The amount of dB volume increases that it takes to increase 1dB of signal above the threshold is known as compression ratio

The only difference between a compressor, limiter, etc are the type of side chain detector, the gain computer attributes and the type of gain control element used

The most significant advantages of digital designs are the ability to analyze a signal before it is processed and statistically analyze recent history

Before compressors, people did what compressors do and it was at the mixing board and was called gain riding

Broadband compression is the simplest form of compression, where all frequencies are compressed equally and the side chain is equally sensitive; An rms detector is typically used and the basic gain computer side chain controls are threshold, ratio, attack and release

2 types of compressors: Variable threshold and fixed threshold (self explanatory)

A number of parameters govern side chain activity: (4 Primary) threshold, ratio, attack & release

A workable range for compressors is -40dBu to +20dBu

The ratio defines the proportion of input to output that the signal will be reduced

Sometimes referred to as "make-up gain" in compressors, this controls the desired output level with compression active; the preferred range for professional applications ±12dB with a center-detent 0-dB unity gain position

Attack defines how quickly the function responds to an increase in side chain input level above the threshold; attack time is the time it takes the compressor to react to the signal once it has been risen above the threshold

Release defines how quickly the function responds to a decrease in side chain level below the threshold; release time is the time it takes the compressor to return to its normal gain after operating above the

This switch (Knee) allows the engineer to select a "soft setting" which causes the gain reduction to begin before the threshold to "ease in" the gain reduction

Hard knee does nothing until the signal exceeds the threshold point and then applies full compression; Soft knee significantly reduces distortion caused by abrupt transitions from unity gain to a compressed signal

Automatic establishes factory set attack and release times; it adjusts internally depending on the signal content

Peak adds a limiter to the compressor to provide a maximum level at which no output will flow from the unit

Meters usually display gain reduction and input/output level

Output gain adjusts the compressor's output, usually to increase the signal level to make up for signal loss related to compression