

## COMPRESSORS AND LIMITERS

A LIMITER is a compressor that has a constant output level regardless of its input level.

A COMPRESSOR has its output decreased as the input level continues to increase.

THE THRESHOLD is the level above which the compressor or limiter begins to function.

In actual practice, compression ratios of 10:1 or greater are usually considered as limiting.

Compression is a term normally reserved for situations where gain reduction is happening more or less continuously. A soft slope of 1.5:1 or 2:1 will preserve most of the original dynamics, whereas a tighter slope 3:1 or even 5:1 results in a tighter sound.

### HELPFUL HINTS

Vocals: a medium to fast attack time is needed to prevent sibilances being emphasised, together with a fast to medium release and a tight slope. But watch for 'grittiness' when using a fast attack on female vocals. Where you need to retain more of the vocalist's dynamic range, the use of a softer slope may be necessary.

Bass and bass drum: use of a slow to medium attack to reduce any 'percussive' effect, fast release and a tight slope will create a 'bigger' sound as the decaying signal is held near RMS or peak level. Bass frequencies are virtually impossible to limit properly in the presence of other sounds, because of modulation effects; better to compress and limit on their own and not in the mix.

Snare, toms and cymbals: again a fast attack and release, plus a medium to tight slope, can improve the impact of a snare sound. Same goes for toms. Cymbals, on the other hand, call for a fast or medium attack to prevent excessive ringing, and a medium slope with medium to fast release, dependent on whether you like a lot of sustain.

Guitar: a fast attack and release, using a tight slope- dependent on the material- can also increase sustain by boosting the decaying sound.

Keyboards: medium to slow attack, fast to medium release and a reasonably tight slope gives a fuller sound from a piano and similar instruments. Care is needed when compressing synthesised sounds because of the different relationship between average and peak level. Too low a threshold with tight compression can enhance keyboard noise as each note is turned on and off.

Strings: Fast attack and release with a medium slope can add body to violins and other stringed instruments, depending on how much of the original dynamic range you wish to retain.

Commpressors and Limiters cont.

Limiting is usually only used for recording speech or instruments with transients so that the signal can be recorded at a high level without overloading the tape. Compression is used for several reasons:

1. It minimizes the change in volume which occurs when an instrumentalist or vocalist momentarily changes his/her distance from the mike.

2. It can make the volume of the different ranges on an instrument the same. For example, some bass guitar strings are usually louder than others on the same guitar, and the use of compression produces a smoother bass line by matching the volume of the different notes. As another example, some instruments such as horns are louder in some registers than in others due to the amount of effort required to produce the notes.

3. Compression enables a signal to be made significantly louder in a mix, while increasing the overall signal-level reading on the meter only slightly, by increasing the ratio of average to peak levels.

4. Compression can be used to reduce sibilance in a voice by inserting a filter in the compressor circuit which causes it to trigger compression when an excess of high-frequency signal is present. A compressor used in this manner is often called a de-esser.

RESOURCES: "Modern Recording Techniques" by Robert E. Runstein  
Article from Sound International March 1980 Titled "The Gentle Art of Compression" by Mel Lambert  
Article from Studio Sound October 1977 Titled "Compressors and Limiters: their uses and abuses" by Mike Beville

Mike Beville

## COMPRESSORS

1. Start with input and output controls all the way down.
2. Select a ratio.
3. Set the meter control on G.R. (GAIN REDUCTION).
4. Increase input gain until meter indicates threshold has been reached. (The needle will move backwards from zero).
5. Continue to increase input until continuous compression of 3 to 7 dB is indicated.
6. Switch the meter control from G.R. to +4.
7. Increase the output control until the needle averages around 0 VU.
8. Refer to chart for other adjustments

*THE ONLY WAY TO LEARN .... IS TO EXPERIMENT.*

	TOO MUCH	NOT ENOUGH	JUST RIGHT
INPUT GAIN (THRESHOLD)	Noticable lack of dynamic range. Quiet and loud levels are nearly the same volume at the output. Very tacky increase in noise.	Input signal too low to trigger threshold, thus dynamic range remains unaffected.	Set so just the peaks trigger the compressor, or a meter reading of 4-8 dB continues.
OUTPUT GAIN	Compressor output volume overdrives the channel, possibly resulting in distortion.	Forces channel fader increase to compensate for a weak output of compressor. Possible addition of noise.	Assures output of compressor to be at or near line level.
RATIO	Produces a "ceiling" for levels that are high enough to trigger the threshold.	Mildly restricts dynamic range. Sometimes allowing program to reach saturation level.	Retaining as much dynamic range as possible yet within the limitations of the tape, or other equipment.
	TOO FAST	TOO SLOW	JUST RIGHT
ATTACK	On low frequency info, (bass guitar, etc.) transients from the attack will be compressed.	On high frequency percussive material, initial transient will still get through.	On low frequency info, medium-slow attack is desirable. On high frequency info, faster attack is desirable.
RELEASE	On low frequency info, compressor might follow low each half cycle.	On quick tempo music, compressor does not return quickly enough.	Quick tempo requires faster release. Low frequency info requires longer release time.