

Noise Reduction

Always strive for noise-free recordings. If noise reduction is necessary, it will, to some degree, affect the sound quality. There is no such thing as completely transparent noise reduction. Noise reduction units are usually placed at the end of the effect chain. However, when placed before reverb and delay type effects, the audible presence of the noise reductive process can be subdued.

Types of Noise Reduction:

- (1) Noise Masking – Most of the time, noise can be masked by other instruments sounding in the same frequency register as the noise.
- (2) Noise Gates – In general, if you didn't make a complete blunder in the recording process (in which case you should try another take), the amplitude of the noise should be below that of the music. In this case, closing off those lower level noises from getting through the line will reduce a lot of noise. Placed in-line, gates may be used to allow signals above a certain level to pass. When the level drops below a certain level, the gate closes keeping sound from passing through. The attack and release times can be controlled creating the possibility for a more natural sound. There may also be a hold time function which extends the gates open duration. When the sound level of the input fluctuates around the threshold level, it may create an effect called "hysteresis." This is created by the gate opening and closing at a fast rate as the signal rises above and drops below the threshold. To solve this problem, a gate may have a second threshold level which is calibrated below the first. Some gates have side-chain inputs so that the opening and closing of the gate can be controlled by another input. An EQ could also be inserted into the side-chain so that the gate responds to certain frequencies.
- (3) Expanders – An expander is like a gate. But where a gate cuts off the signal completely, an expander simply reduces the signal's level. When the signal falls below a certain level, the signal is reduced in volume. The functions of an expander are therefore the opposite of the compressor. A "Compander" is a unit that first compresses a signal and then later expands the compressed signal.
- (4) Dynamic Noise Filters – Reduces the frequency content of a signal as its level drops. The frequency response is variable.
- (5) Digital Noise Reduction (Multi-Band Noise Reduction) – Very sophisticated! The signal is divided into a number of bands. Each band is routed through its own gate or expander. When each band falls below that bands threshold, the signal is cut off or lowered in volume. This is done "on the fly" by the computer which performs a spectrum analysis of the signal.
- (6) De-Clicking and De-Crackling – Removes clicks, scratches, and other digital glitches from the source.