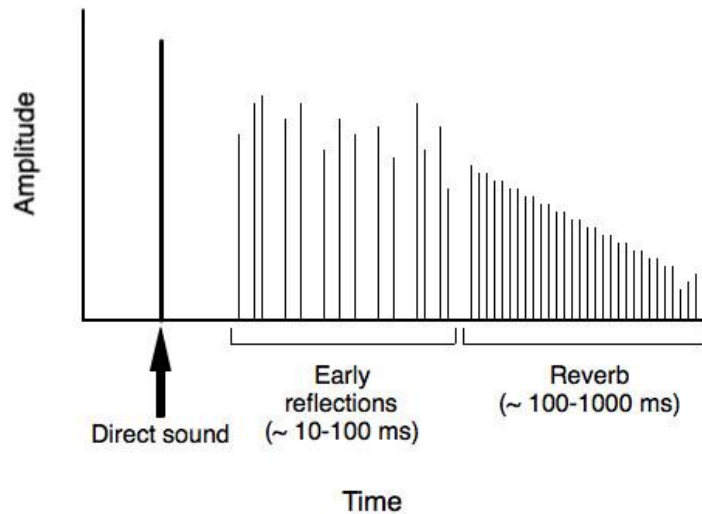**BEGINNER'S GUIDE TO HOME RECORDING ON A BUDGET**
Part 7: Reverberation

This effect adds a sense of room acoustics, ambience, or space to instruments and voices. To know how it works, we need to understand how reverb happens in a real room. Natural reverberation in a room is a series of multiple sound reflections that make the original sound persist and gradually die away or decay. These reflections tell the ear that you're listening in a large or hard-surfaced room. For example, reverberation is the sound you hear just after you shout in an empty gymnasium.

A reverb effect simulates the sound of a room—a club, auditorium, or concert hall—by generating random multiple sound reflections that are too numerous and rapid for the ear to resolve (See figure, from Practical Music Production). Digital reverb is available either in a dedicated reverb unit, as part of a multieffects processor, or as a plug-in.

The most natural sounding digital reverb is a sampling reverb or convolution reverb, which creates the reverb from impulse-response samples (wave files) of real acoustic spaces, rather than from algorithms. Convolution reverbs consume a lot of CPU processing power.

Reverb and echo are not the same thing. Echo is a repetition of a sound ("HELLO hello hello"); reverb is a smooth decay of sound ("HELLO-OO-oo-oo").

Reverb Parameters

Here are some controls in a reverb unit or plug-in:

* Reverb Time (RT60 or Decay): The time it takes for reverberation to decay 60 dB below its original level. Set it long (1.5 to 2 seconds) to simulate a large room; set it short (under 1 second) to simulate a small room. Generally you use short reverbs (or no reverb) for fast songs, and long reverbs for slow songs. Snare reverb should die out between hits to prevent masking.

* Dry/wet mix: Dry sound is the sound of a track without reverb; wet is the reverberated signal. You might start with the wet sound about 15 dB below the dry sound, and vary from there. Beginners often

use too much reverb. Listen to commercial recordings similar to your genre to hear typical amounts of reverb.

*Predelay (pre-reverb delay): A short delay (23 to 120 msec) before the onset of reverb to simulate the delay that happens in real rooms before reverb starts. The longer the predelay, the bigger the room sounds. Using predelay on a track's reverb often helps to clarify the sound by removing the onset of reverb from the direct sound of the instrument or vocal. Predelay tends to unmask the reverb and make it sound louder, so turn down the reverb-send level to compensate.

*Density: A high density setting produces many echoes spaced close together. It gives a smooth decay but increases the load on the CPU. A low-density setting produces fewer echoes spaced farther apart, and may be adequate for vocals, synth pads, and organ. Use high density for percussive sounds to prevent grainy-sounding reverb.

*Diffusion: How spread out in space the reverb is.

*Early reflections: These are the first few sound reflections, usually within 80 to 100 msec of the direct sound. They contribute a sense of ambience and depth. Adding only early reflections to a dry signal can enhance a distorted guitar or enliven a dry vocal.

*Damping: Adjusts the reverb time or decay at high frequencies. Set the damping frequency high (say, 7 kHz) to simulate a hard-surfaced room; set it low (say, 2 kHz) to simulate a soft-surfaced room. The latter is also called a "warm room" reverb.

*EQ or rolloff: Some reverbs let you adjust the low- and high-frequency limit of the signal feeding the reverb. You might roll off the highs in the reverb to make it smoother and less obvious, or roll off the lows below 300 Hz to prevent muddiness.

*Presets: Factory-supplied reverb settings of small rooms, auditoriums, halls, and so on. A plate reverb setting duplicates the bright sound of a metal-foil plate, which used to be the most popular type of reverb in pro studios for vocals and drums. Unnatural effects are available, such as nonlinear decay, reverse reverb that builds up before decaying, or gated reverb.

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