



Musical Time in Delay, Reverb, and Modulation

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Tying an effect's timing to a song's tempo is a well-established starting point: it keeps the effect rhythmically related to the music instead of arbitrary. It is a starting point, not a universal correct setting for every mix, and every time-based calculator on this site states that distinction explicitly.

One formula, several destinations

At 120 BPM, a quarter note lasts 500 ms ($60,000 / \text{BPM}$). [Tempo-Synced Delay Calculator](#) uses that value directly as a delay time; [Reverb Time Calculator](#) uses it as a starting reference for how long a reverb tail might musically sit under the beat, and [Tempo Conversion Calculator](#) exposes the full note-value and dotted/triplet table this all derives from.

Hz and milliseconds describe the same relationship

An LFO's rate is conventionally given in Hz (cycles per second) rather than milliseconds, even though rate and duration are simple reciprocals of each other ($\text{Hz} = 1000 / \text{ms}$). [LFO Tempo Sync Calculator](#) converts a tempo-derived note duration into the matching Hz rate for exactly this reason.

A tempo-synced release time does not guarantee no pumping

[Sidechain Release Calculator](#) and [Compressor Time Constant Explorer](#) give a musically related starting release or attack time tied to the song's tempo. Whether the resulting envelope actually pumps audibly still depends on the material, ratio, and threshold, none of which a timing calculation alone controls.

Frequently asked questions

Is a tempo-synced delay time automatically the "right" delay for a mix?

No. It is a transparent, musically related starting point, an eighth note or dotted eighth at the song's tempo, for example. Whether that specific delay time serves the actual mix is a judgment call the calculator does not make.

Why does an LFO rate use Hz while a delay time uses milliseconds?

They describe the same underlying relationship (rate and duration are reciprocals: $\text{Hz} = 1000 / \text{ms}$), but Hz is the conventional unit for a repeating rate like an LFO, while milliseconds is conventional for a single time-based event like a delay tap.

Does a tempo-synced release time on a compressor guarantee no pumping?

No. It gives a musically related starting value tied to the song's tempo; whether the resulting envelope pumps audibly still depends on the material, the ratio, and the threshold, none of which the timing calculation alone controls.

Where this shows up

PRODUCTION AND AUDIO MATH

Tempo-Synced Delay Calculator

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Reverb Time Calculator

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LFO Tempo Sync Calculator

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Sidechain Release Calculator

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Compressor Time Constant Explorer