

Air Absorption Gain HF

Specify using this ID	AL_EAXREVERB_AIR_ABSORPTION_GAINHF
Value type	FLOAT
Value range	0.892 to 1.0
Default value	0.994
Value units	Linear gain per meter

The Air Absorption Gain HF property controls the distance-dependent attenuation at high frequencies caused by the propagation medium. It applies to reflected sound only. You can use Air Absorption Gain HF to simulate sound transmission through foggy air, dry air, smoky atmosphere, and so on. The default value is 0.994 (-0.05 dB) per meter, which roughly corresponds to typical condition of atmospheric humidity, temperature, and so on. Lowering the value simulates a more absorbent medium (more humidity in the air, for example); raising the value simulates a less absorbent medium (dry desert air, for example).

Decay HF Limit

Specify using this ID	AL_EAXREVERB_DECAYHF_LIMIT
Value type	INTEGER
Value range	AL_FALSE, AL_TRUE
Default value	AL_TRUE

When this flag is set, the high-frequency decay time automatically stays below a limit value that's derived from the setting of the property [Air Absorption Gain HF](#). This limit applies regardless of the setting of the property Decay HF Ratio, and the limit doesn't affect the value of [Decay HF Ratio](#). This limit, when on, maintains a natural sounding reverberation decay by allowing you to increase the value of Decay Time without the risk of getting an unnaturally long decay time at high frequencies. If this flag is set to AL_FALSE, high-frequency decay time isn't automatically limited.

Standard Reverb

AL_EFFECT_REVERB is the standard Effects Extension's environmental reverberation effect.

Reverb Density

Specify using this ID	AL_REVERB_DENSITY
Value type	FLOAT
Value range	0.0 to 1.0
Default value	1.0

Reverb Modal Density controls the coloration of the late reverb. Lowering the value adds more coloration to the late reverb.

Reverb Diffusion

Specify using this ID	AL_REVERB_DIFFUSION
Value type	FLOAT
Value range	0.0 to 1.0
Default value	1.0
Value units	A linear multiplier value

The Reverb Diffusion property controls the echo density in the reverberation decay. It's set by default to 1.0, which provides the highest density. Reducing diffusion gives the reverberation a more "grainy" character that is especially noticeable with percussive sound sources. If you set a diffusion value of 0.0, the later reverberation sounds like a succession of distinct echoes.

Reverb Gain and Reverb Gain HF

Specify using this ID	AL_REVERB_GAIN
Value type	FLOAT
Value range	0.0 to 1.0
Default value	0.32
Value units	Linear gain

The Reverb Gain property is the master volume control for the reflected sound (both early reflections and reverberation) that the reverb effect adds to all sound sources. It sets the maximum amount of reflections and reverberation added to the final sound mix. The value of the Reverb Gain property ranges from 1.0 (0db) (the maximum amount) to 0.0 (-100db) (no reflected sound at all).

Specify using this ID	AL_REVERB_GAINHF
Value type	FLOAT
Value range	0.0 to 1.0
Default value	0.89
Value units	Linear gain

The Reverb Gain HF property further tweaks reflected sound by attenuating it at high frequencies. It controls a low-pass filter that applies globally to the reflected sound of all sound sources feeding the particular instance of the reverb effect. The value of the Reverb Gain HF property ranges from 1.0 (0db) (no filter) to 0.0 (-100db) (virtually no reflected sound).

Decay Time and Decay HF Ratio

Specify using this ID	AL_REVERB_DECAY_TIME
Value type	FLOAT
Value range	0.1 to 20.0
Default value	1.49
Value units	Seconds

The Decay Time property sets the reverberation decay time. It ranges from 0.1 (typically a small room with very dead surfaces) to 20.0 (typically a large room with very live surfaces).

Specify using this ID	AL_REVERB_DECAY_HFRATIO
Value type	FLOAT
Value range	0.1 to 2.0
Default value	0.83
Value units	A linear multiplier value

The Decay HF Ratio property sets the spectral quality of the Decay Time parameter. It is the ratio of high-frequency decay time relative to the time set by Decay Time. The Decay HF Ratio value 1.0 is neutral: the decay time is equal for all frequencies. As Decay HF Ratio increases above 1.0, the high-frequency decay time increases so it's longer than the decay time at low frequencies. You hear a more brilliant reverberation with a longer decay at high frequencies. As

the Decay HF Ratio value decreases below 1.0, the high-frequency decay time decreases so it's shorter than the decay time of the low frequencies. You hear a more natural reverberation.

Reflections Gain and Reflections Delay

Specify using this ID	AL_REVERB_REFLECTIONS_GAIN
Value type	FLOAT
Value range	0.0 to 3.16
Default value	0.05
Value units	Linear gain

The Reflections Gain property controls the overall amount of initial reflections relative to the Gain property. (The Gain property sets the overall amount of reflected sound: both initial reflections and later reverberation.) The value of Reflections Gain ranges from a maximum of 3.16 (+10 dB) to a minimum of 0.0 (-100 dB) (no initial reflections at all), and is corrected by the value of the Gain property. The Reflections Gain property does not affect the subsequent reverberation decay.

You can increase the amount of initial reflections to simulate a more narrow space or closer walls, especially effective if you associate the initial reflections increase with a reduction in reflections delays by lowering the value of the Reflection Delay property. To simulate open or semi-open environments, you can maintain the amount of early reflections while reducing the value of the Late Reverb Gain property, which controls later reflections.

Specify using this ID	AL_REVERB_REFLECTIONS_DELAY
Value type	FLOAT
Value range	0.0 to 0.3
Default value	0.007
Value units	Seconds

The Reflections Delay property is the amount of delay between the arrival time of the direct path from the source to the first reflection from the source. It ranges from 0 to 300 milliseconds. You can reduce or increase Reflections Delay to simulate closer or more distant reflective surfaces—and therefore control the perceived size of the room.

Late Reverb Gain and Late Reverb Delay

Specify using this ID	AL_REVERB_LATE_REVERB_GAIN
Value type	FLOAT
Value range	0.0 to 10.0
Default value	1.26
Value units	Linear gain

The Late Reverb Gain property controls the overall amount of later reverberation relative to the Gain property. (The Gain property sets the overall amount of both initial reflections and later reverberation.) The value of Late Reverb Gain ranges from a maximum of 10.0 (+20 dB) to a minimum of 0.0 (-100 dB) (no late reverberation at all).

Note that Late Reverb Gain and Decay Time are independent properties: If you adjust Decay Time without changing Late Reverb Gain, the total intensity (the averaged square of the amplitude) of the late reverberation remains constant.

Specify using this ID	AL_REVERB_LATE_REVERB_DELAY
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Value type	FLOAT
Value range	0.0 to 0.1
Default value	0.011
Value units	Seconds

The Late Reverb Delay property defines the begin time of the late reverberation relative to the time of the initial reflection (the first of the early reflections). It ranges from 0 to 100 milliseconds. Reducing or increasing Late Reverb Delay is useful for simulating a smaller or larger room.

Room Rolloff Factor

Specify using this ID	AL_REVERB_ROOM_ROLLOFF_FACTOR
Value type	FLOAT
Value range	0.0 to 10.0
Default value	0.0
Value units	A linear multiplier value

The Room Rolloff Factor property is one of two methods available to attenuate the reflected sound (containing both reflections and reverberation) according to source-listener distance. It's defined the same way as OpenAL's Rolloff Factor, but operates on reverb sound instead of direct-path sound. Setting the Room Rolloff Factor value to 1.0 specifies that the reflected sound will decay by 6 dB every time the distance doubles. Any value other than 1.0 is equivalent to a scaling factor applied to the quantity specified by $((\text{Source listener distance}) - (\text{Reference Distance}))$. Reference Distance is an OpenAL source parameter that specifies the inner border for distance rolloff effects: if the source comes closer to the listener than the reference distance, the direct-path sound isn't increased as the source comes closer to the listener, and neither is the reflected sound.

The default value of Room Rolloff Factor is 0.0 because, by default, the Effects Extension reverb effect naturally manages the reflected sound level automatically for each sound source to simulate the natural rolloff of reflected sound vs. distance in typical rooms. (Note that this isn't the case if the source property flag `AL_AUXILIARY_SEND_FILTER_GAIN_AUTO` is set to `AL_FALSE`) You can use Room Rolloff Factor as an option to automatic control so you can exaggerate or replace the default automatically-controlled rolloff.

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Decay HF Limit

Specify using this ID	AL_REVERB_DECAY_HFLIMIT
Value type	INTEGER
Value range	AL_FALSE, AL_TRUE
Default value	AL_TRUE

When this flag is set, the high-frequency decay time automatically stays below a limit value that's derived from the setting of the property Air Absorption HF. This limit applies regardless of the setting of the property Decay HF Ratio, and the limit doesn't affect the value of Decay HF Ratio. This limit, when on, maintains a natural sounding reverberation decay by allowing you to increase the value of Decay Time without the risk of getting an unnaturally long decay time at high frequencies. If this flag is set to AL_FALSE, high-frequency decay time isn't automatically limited.

Chorus

The chorus effect essentially replays the input audio accompanied by another slightly delayed version of the signal, creating a 'doubling' effect. This was originally intended to emulate the effect of several musicians playing the same notes simultaneously, to create a thicker, more satisfying sound.

To add some variation to the effect, the delay time of the delayed versions of the input signal is modulated by an adjustable oscillating waveform. This causes subtle shifts in the pitch of the delayed signals, emphasizing the thickening effect.

Chorus Waveform

Specify using this ID	AL_CHORUS_WAVEFORM
Value type	INTEGER
Value range	0 (sin), 1 (triangle)
Default value	1

This property sets the waveform shape of the LFO that controls the delay time of the delayed signals.

Chorus Phase

Specify using this ID	AL_CHORUS_PHASE
Value type	INTEGER
Value range	-180 to 180
Default value	90

This property controls the phase difference between the left and right LFO's. At zero degrees the two LFOs are synchronized. Use this parameter to create the illusion of an expanded stereo field of the output signal.

Chorus Rate

Specify using this ID	AL_CHORUS_RATE
Value type	FLOAT
Value range	0.0 to 10.0