

Dolby® TrueHD Encoder with Advanced 96k Upsampling

Feature Summary

- Upsamples 48 kHz PCM content to 96 kHz using Meridian's world-class upsampling algorithm.
- Applies an advanced apodizing filter that masks preringing artifacts introduced upstream by analog-to-digital converters used in either the recording or playback stage by shifting them into postringing. The resulting increase in postringing is inaudible as it is masked.
- The apodizing filter does not remove any audio from the file. Instead, the filter shifts the location of unnatural artifacts that the brickwall filtering phenomenon of signal conversion introduces into content.

The sophisticated filtering and upsampling provided by the Dolby® TrueHD Encoder to generate 96 kHz material during content creation minimizes the computational demands that would ordinarily be associated with incorporating this technology into a hardware product such as a Blu-ray™ player or A/V receiver.

The resulting 96 kHz content enables optimum performance from downstream connected A/V receivers equipped with 96 kHz digital-to-analog converters, enabling them to operate at their maximum efficiencies.

Content created with Dolby's advanced 96k upsampling feature is fully playback compatible on all Blu-ray devices.

Figure 1 is a screenshot exhibiting typical preringing in the original PCM audio (top) and the resulting sonic signature after the Meridian apodizing filter is applied (bottom).

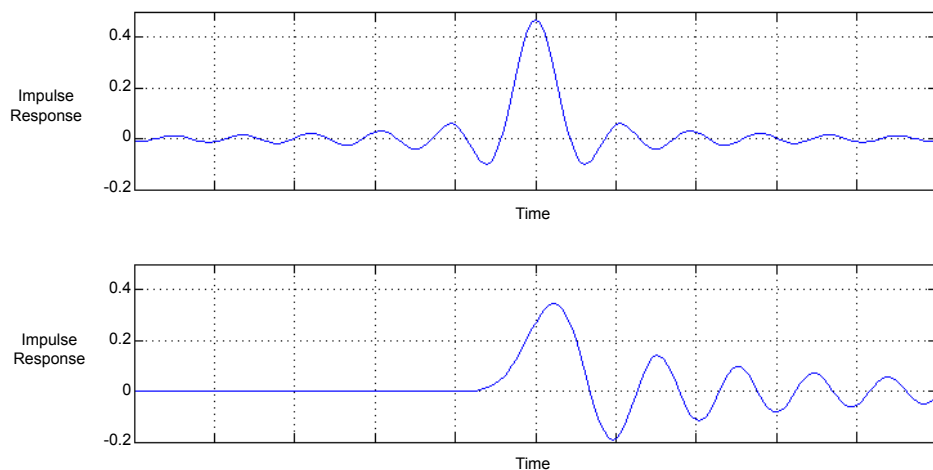


Figure 1. Typical Response with Preringing (top) and Response with Apodizing (bottom)

The audio used for this test consists of impulses similar to a rim shot on a snare drum. This type of sample or sound is an ideal way to vividly exhibit the detrimental effect of preringing introduced during analog-to-digital conversion of the recorded signal.

Acoustically, this preringing has an effect on high-frequency impulses such as cymbals and ambiences. Listeners will note a subtle level of smoothness and detail that has been restored to the soundtrack through the masking of these artifacts.

The graph in Figure 2 displays the frequency response of both the original 48 kHz audio and the upsampled and apodized audio to 96 kHz. The response matches beyond 20 kHz, and the -3 dB point is at 22.33 kHz (beyond human hearing range). The filter that is applied to keep audio below the critical Nyquist frequency has a subtle slope that helps keep pre-ringing from occurring.

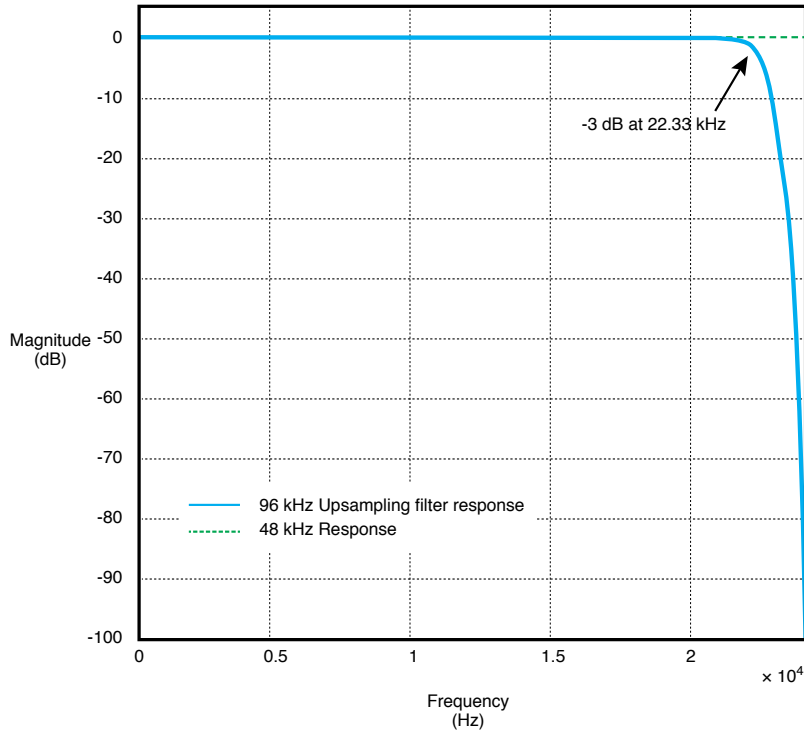


Figure 2. Frequency Response of 48 kHz and 96 kHz Audio

In summary, the process of advanced 96k upsampling is shown to mask only unnatural pre-ringing artifacts introduced in digital audio, while preserving the integrity of the original audio signal. This process is available in Dolby Media Encoder version 2.0 and is easily applied by selecting a check box.



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