

# Beltone Serene™ CROS: Less internal noise for a better listening experience

## Less internal noise matters.

Single-sided deafness (SSD) can be challenging to live with – and for hearing care professionals (HCPs) to successfully treat.

One issue that can be difficult to address is internal device noise. Because the CROS receiver is fitted to an ear with normal to near-normal hearing, low-level artifacts from the device are often audible in quieter listening situations<sup>1</sup>.

## Fitting tips to reduce internal noise:

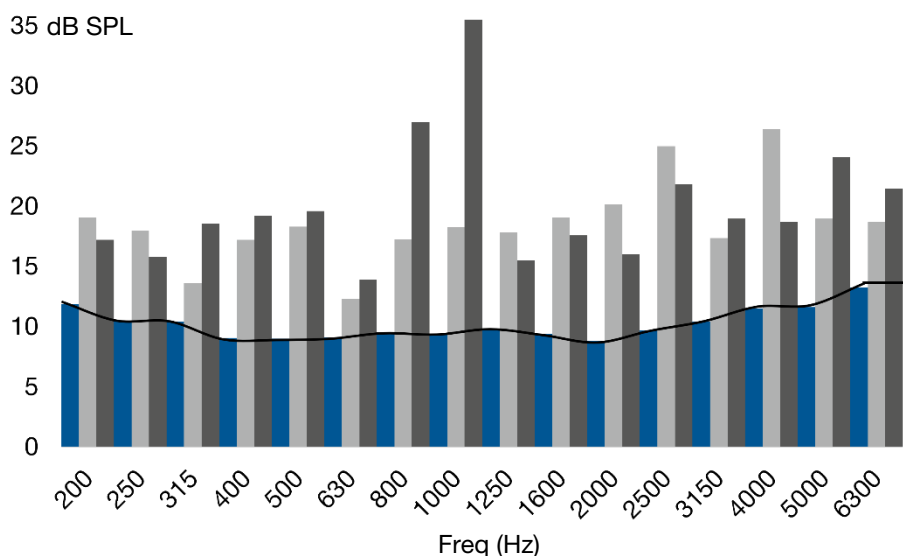
- Prevent occlusion in the better ear<sup>1</sup>.
- Keep gain in the receiver device as low as possible, especially in the lower frequencies<sup>1</sup>.
- Activate Silencer in the fitting software.
- Set Mixing Point Frequency to Medium or High (when applicable).

Unfortunately, it can be very difficult to remove internal noise for a user with a normal-hearing ear.

## Smart design means preventing noise in the first place.

The four-mic beamformer is repurposed for e2e transmission in Beltone Serene CROS devices. The beamformer transmits a constant, high-quality audio stream to the receiver device.

The signal-to-noise ratio (SNR) of the beamformer is improved before transmission by compressing the microphone dynamic range. This excludes low-level noise from the input, preventing it from becoming audible artifact. Compression at this stage also reduces the amplitude of loud sounds, preventing peak clipping. This signal is transmitted to the receiver device, then it is expanded back to its original dynamic range. The result is a cleanly-reproduced signal with less internal noise and less distortion.



## Measurement of equivalent input noise (EIN)

The internal noise level in Beltone Serene and two competitors was quantified by measuring EIN. Devices were fitted in BiCROS mode with 10 dB linear gain<sup>2</sup>. The mean EIN measured from 200-6300 Hz:

- Beltone Serene BiCROS = 10 dB
- Brand A BiCROS = 20 dB
- Brand B BiCROS = 19 dB

References: 1. Dillon (2001) 2. Internal GN measurement