# Combined Cochlear Implant and Speech Processing Hearing Aid for Implant Users With a Severe to Profound Hearing Loss in the Contralateral Ear

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The bimodal device was developed for cochlear implant users who simultaneously wear a hearing aid in the opposite ear having residual hearing of a severe to pro-

found degree. The aim was to create a single device to provide both input signals in a more compatible manner and thus maximise use of the individual's total hearing capabilities. The acoustic component of the bimodal device is very flexible and can implement various speech processing strategies with speed, ease and precision. The Frequency Response Tailoring strategy utilises three filters to fit a frequency gain curve to within 1–2 dB of that desired. Modifications at discrete frequencies, ranges or slopes can be readily made. The Peak Sharpening or Spectral Enhancement strategy amplifies the formant peaks in speech for potential improvement of formant resolution and speech perception in the presence of background noise. The Resynthesis strategy presents specifically selected components of speech in selected combinations and includes the ability to transpose higher frequency information to lower frequency ranges for individuals with no aidable high frequency hearing levels. Different fits can be quickly and easily interchanged for comparison and evaluation and subsequent modifications indicated can be readily effected. Any combination of acoustic and implant speech processing strategy can be presented to optimise speech perception for the individual user.

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