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***Abstract* - Sensorineural hearing loss is associated with widening of auditory filter bandwidths, leading to increased spectral masking and degraded speech perception. Multiband frequency compression can be used for reducing the effects of spectral masking. In this technique, the speech spectrum is divided into a number of analysis bands and spectral samples in each of these bands are compressed towards the band center by a constant compression factor. Implementation of the scheme with different types of frequency mappings, bandwidths, and segmentation for processing is investigated. Listening tests conducted for assessing the quality and intelligibility of the processed speech gave best results for critical bandwidth based compression using spectral segment mapping and pitch-synchronous processing.**