Some viewers have commented that the speech in recent broadcasting seems too rapid for easy listening. NHK STRL, to complement its “human-friendly” broadcasting technologies, has pioneered the construction of “speech rate conversion technology,” which allows a listener to slow the rate of speech in a program while maintaining its vocal pitch and quality and without extending the length of the program. Regarding this technology, STRL provided technical support to the manufacturer*, who produced the radio receiver incorporating this new technology.

The conventional means of compensating for a difficulty in hearing is a hearing aid. However, a hearing aid is only designed to compensate for a perceptual degradation related to the dynamics of loudness and audio frequency range. It does not alleviate the difficulty of hearing rapid speech. This led us to the idea of adjusting the speech rate itself for easier listening.

A slow replay using a tape recorder has been used as a simple method for speech rate adjustment. While this method can "slow down" the sound, it also lowers the vocal pitch, thus making the output sound like it is dragging, which is very hard to listen to. The speech rate conversion technology developed by STRL changes the rate of speech in a way similar to how a person actually speaks, by means of digital signal processing based on the human phonation mechanism. It sequentially detects the period of vocal cord vibrations, which determine vocal pitch, to perform a high-quality speech rate adjustment while maintaining the detected characteristics.

However, the time extension caused by slowing the speech rate would become an issue affecting immediacy, which is an advantage of broadcasting. To make the adjusted speech as close as possible to the original broadcast time, this system makes the beginning of speech especially slower, while shortening the pauses between words, but only to an extent that does not produce listening incongruities. A hearing test conducted with a large number of elderly subjects confirmed the effectiveness of the system.

The system is useful not only for elderly listeners, but also for native speakers listening to foreign language broadcasts, or non-native speakers listening to Japanese broadcasts. It is expected that it will be used for a wide range of applications. Other unique functions incorporated by the manufacturer include a function to adjust speech that is too loud or too low, which creates a more balanced sound level for easier listening. Another function enables a listener to replay a 10-second portion of speech that he or she might have missed.

* Victor Company of Japan, Limited (JVC)