

Field Study News

New EasyFM Feature for Naída Quick and reliable

Overview

EasyFM is a feature that activates the FM+M program automatically as soon as a signal is detected at the microphone input of the FM transmitter. This feature simplifies the use of FM in that no manual actions are required to gain FM access. A new hearing instrument software version for the Naída line of hearing instruments is intended to facilitate quick and reliable switching to the FM+M program with EasyFM.

In this study, this new version of EasyFM was tested in 8 subjects. All were equipped with Naída IX and ML10i receivers in both ears.

Results showed that comprehension of the input to the FM transmitter microphone was accomplished after approximately 0.7 – 1 sec in more than 85% of all cases and in almost 100% of all cases after 1.8 – 2 sec with the FM+M program.

Introduction

Phonak hearing instruments with EasyFM automatically switch to the FM+M program as soon as a signal is detected at the microphone of the active FM transmitter, provided they are in the SoundFlow automatic mode. In addition, the hearing instruments automatically switch back to SoundFlow when the FM receiver have not received a signal for more than 50 seconds. The hearing instrument microphone(s) always remain active when EasyFM is applied (see Figure 1).

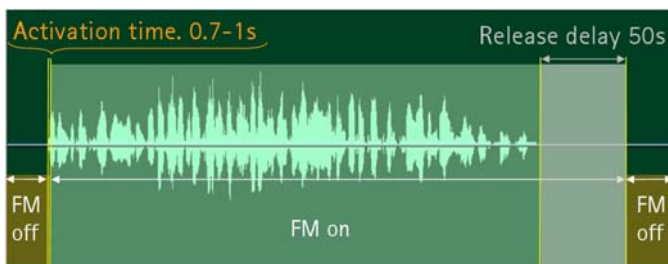


Figure 1: Switch timing with EasyFM

The optimized EasyFM feature for the Naída hearing instruments is intended primarily to provide quick and reliable FM+M program activation. The FM application is made

considerably easier for users, as they no longer need to switch the program manually by pushing a button on the instruments. Furthermore, it is not necessary for the FM transmitter to be within range of the remote control, as is the case with competitive FM systems.

The primary challenge with the automatic switching behaviour is to define time constants that consistently switching is guaranteed so that no important information is lost. The optimization of the EasyFM function of the Naída product line should, above all, accomplish fast and reliable automatic of the FM+M program.

Various studies have already documented the advantages of FM systems in improving the signal-to-noise ratio (SNR) in noisy environments (Boothroyd (2004), Fabry (1994), Lewis (2004)).

Methods

The study was conducted at the Phonak Hearing Center in Stäfa, Switzerland. The laboratory tests were conducted in a sound-treated room, using *inspiro* and also SmartLink+ transmitters.

Transmitters were placed in front of a speaker at distance of 18 cm which correlates to the standard distance from the speaker's mouth to the microphone of the FM transmitter. During testing, subjects were outside of the test room and could receive the speech signal from the speaker exclusively via the FM connection (see Figure 2).



Figure 2: Testing setup

Subjects were given the task to repeat sentences from the Oldenburger sentence test (OLSA) - 5 sentences with the **inspiro** transmitter and 3 sentences with the SmartLink+ transmitter. With SmartLink+, one sentence was repeated for each of the microphone modes - Omni, Zoom and SuperZoom. To ensure that the sentences were always presented at 65 dB (SPL), the OLSA test was interrupted after each sentence and re-started at 65 dB (SPL) for the next measurements. No additional noise was presented. The subjects were instructed to repeat the words they heard as soon as the FM link was established and they could identify them. This test procedure should assess the speed and reliability of the establishment of the FM link and the identification of the first words.

The second word of a standard OLSA sentence is presented after approximately 0.25 sec. The third word is spoken after approximately 0.7 - 1 sec; the fourth, 1.05 - 1.5 sec; and the fifth, 1.4 - 1.8 sec.

Test subjects and instruments

Eight people participated in the study to assess the EasyFM feature. They were fitted binaurally with Naída IX UP instruments and ML10i receivers.

The average participant age was 59.9 years (age range: 43-81 years). The average hearing loss is illustrated in Figure 3.

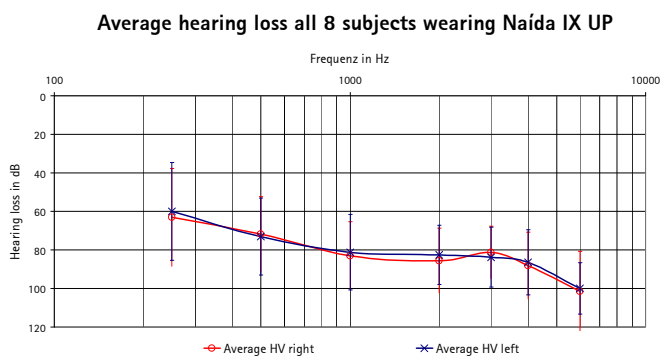


Figure 3: Average HL of all test subjects with Naída IX UP

Results

In the laboratory tests with **inspiro**, the second word was identified 7.5% of the time, 85% for the third word, 97.50% for the fourth word, and 100% for the fifth word (see Figure 4, a sentence example is shown on the X-axis).

SmartLink+ measurements were conducted with the Omni, Zoom and SuperZoom microphone settings. No difference could be distinguished between the settings with regard to the switching behavior. Therefore, the three microphone settings were compiled together in the illustrated results.

In all cases, a 12.5% identification of the second word of the OLSA sentence was attained, 83.33% for the third word, 95.83% for the fourth word, and 95.83% for the fifth word (see Figure 4, a sentence example is shown on the X-axis). In

one case, although the subject could not repeat any of the words, an external observer could hear the instruments switch to the FM+M program on time.

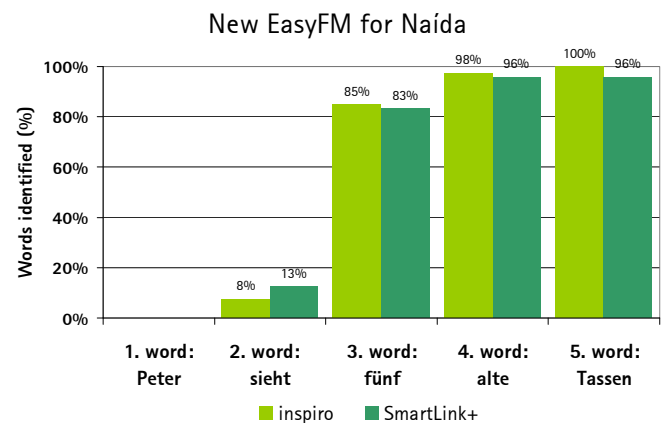


Figure 4: Results for improved EasyFM with inspiro

Otherwise, results revealed only very small differences between inspiro and SmartLink+. This can be traced back to the relatively small random sampling and also to the different number of measurement points (5 for inspiro, 3 for SmartLink+). Accordingly, with a larger number of measurement points, no discernible statistical differences between the transmitters would be expected.

Discussion

The study results yield two decisive results. First, switching to the FM+M program is very quick with EasyFM, i.e., always less than 2 sec. Furthermore, 100% reliability was documented in the automatic activation of the FM+M program. These results prove that people wearing Naída hearing instruments with the new EasyFM feature experience simple and reliable access to FM.

Literature

Boothroyd A (2004). *Ear & Hearing* 25(1):22-33.

Fabry D (1994). *Ear & Hearing* 13:82-86.

Lewis MS et al. (2004). *J Am Acad Audiol* 15:426-439

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