A Quick Comparison of the FONIX 8000 Hearing Aid Test System to a Laboratory-Quality Anechoic Chamber

by George Frye

Summary

Frye Electronics lent a new FONIX 8000 Hearing Aid Test System to a hearing aid manufacturer customer located in Minneapolis, MN. In an independent study, this company compared the directional polar plot response of a hearing aid made with the FONIX 8000 (with an 8120 Polar Plot Sound Chamber) to the response made with a laboratory-quality anechoic chamber. The test results were very encouraging, especially considering the size and expense of an anechoic chamber versus a desktop 8000 Hearing Aid Test System. Best accuracy will always be achieved with actual laboratory equipment, but the FONIX 8000 with the 8120 Polar Plot Sound Chamber can provide a good approximation of laboratory test results within a clinical environment for a fraction of the cost.

Hearing Aid Setup

In both the anechoic chamber setup and the FONIX 8120 Polar Plot Sound Chamber setup (used with the 8000 Hearing Aid Test System), the hearing aid was placed in a rotational device so that the center of rotation passed through the centerline between the two hearing aid microphones. The microphones were positioned so that the front microphone opening was toward the sound source at 0 degrees azimuth. A line extended from between the openings of the two microphones passed through the center of the sound source speaker.

A two-dimensional polar response test was performed at the pure-tone frequencies of 1000, 2000, 3000 and 4000 Hz. Response outputs were taken every five degrees of rotation for a total of 72 positions from 0 to 355 degrees.

The anechoic chamber is a special custom-made sound treated room in which the hearing aid was positioned a distance of one meter from the speaker. The FONIX 8120 Polar Plot Sound Chamber is a desktop device in which the distance between the hearing aid and the speaker is only four inches.

Test Results

The attached graphs contain a comparison of the polar plot response at 1000, 2000, 3000, and 4000 Hz. The 4000 Hz response was noisy since the hearing aid response rolled off quickly at this frequency, and the input level of the test was not enough to overcome the noise level of the analyzer microphone in the reverse polar position.

The angularity of the actual test results was slightly skewed since the hearing aid was not positioned exactly 0 degrees azimuth to the speaker in the 8120 Polar Plot Sound Chamber. Graphed test results have been corrected in 5 degree increments of 10 degrees, 5 degrees, 15 degrees and 15 degrees for the frequencies of 1000, 2000, 3000 and 4000 Hz, respectively. Data is normalized against the response at the 0 degree position in dB.

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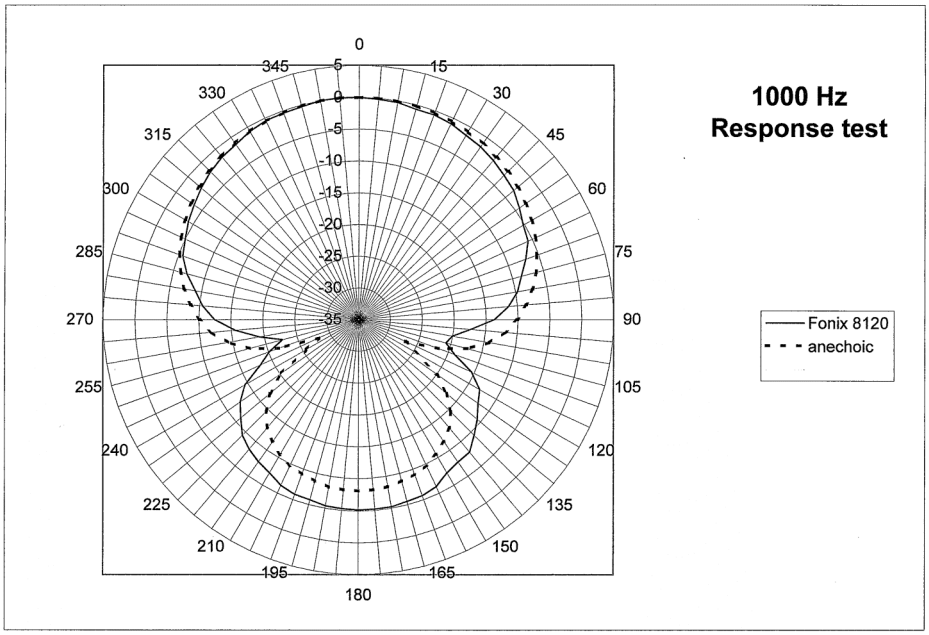
1000 Hz
Response test
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Fonix 8120
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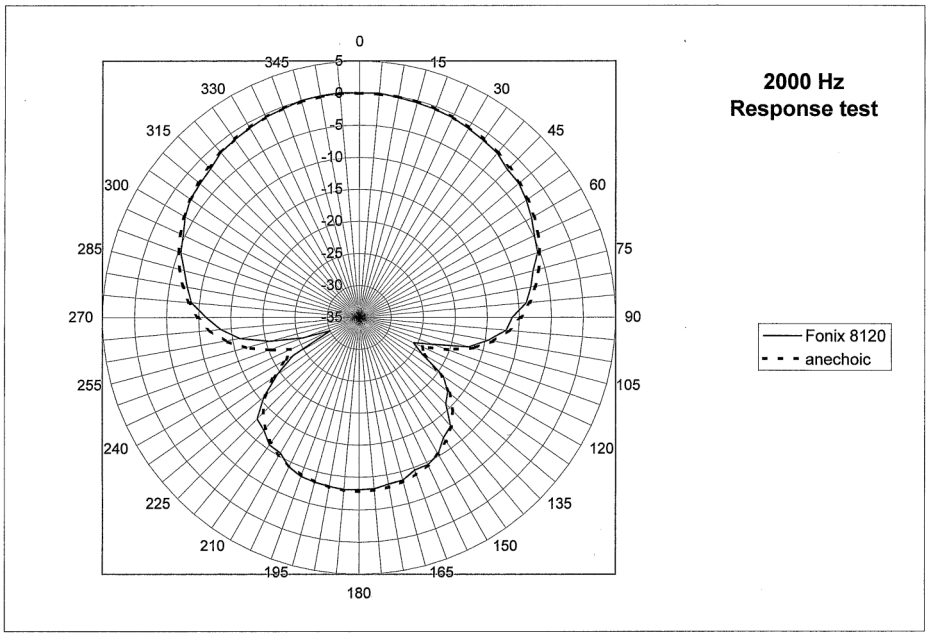
2000 Hz
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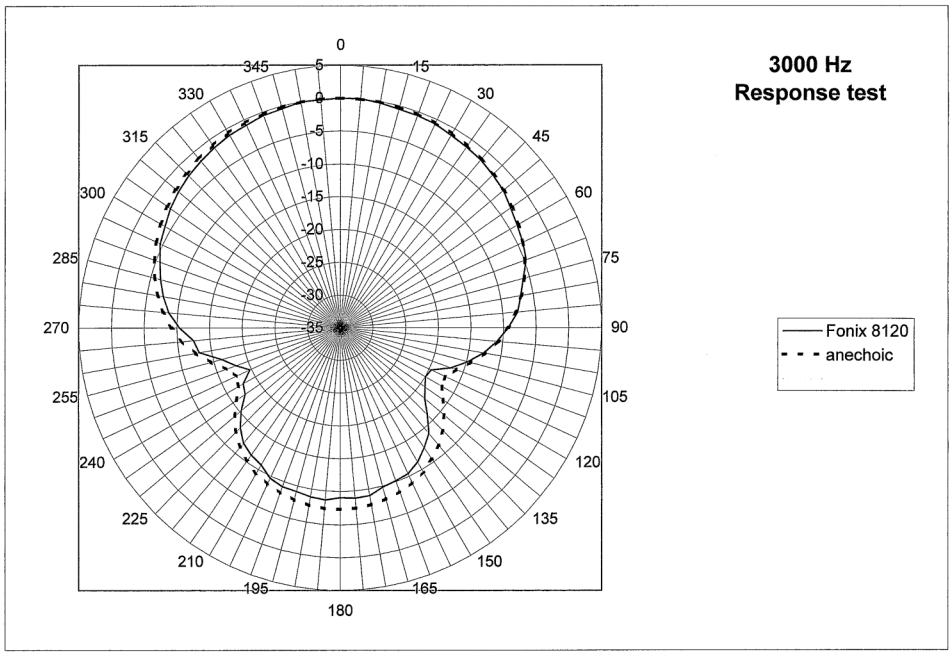
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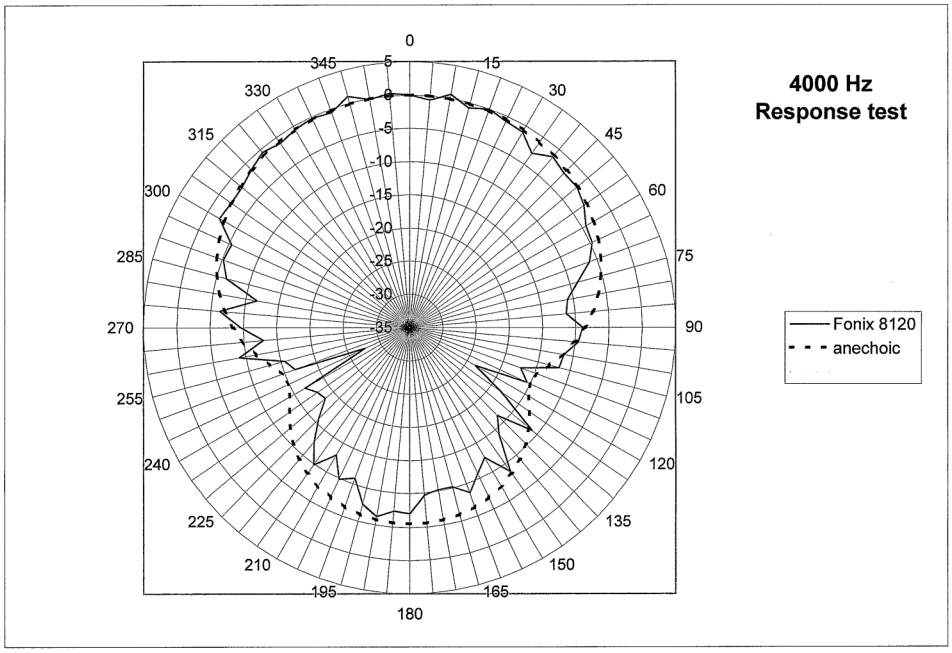
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4000 Hz
Response test
Fonix 8120
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