

# PERFORMING THE ACCEPTABLE NOISE LEVEL (ANL) TEST USING THE FONIX FA10/12 AUDIOMETER

When being fit with hearing aids for the first time, some people have trouble adjusting to all the new amplified noises that hearing aids provide along with the amplified speech signals. Researchers have determined that if you determine how much a person will accept noise within a speech signal, you can predict whether or not the person will be an immediately successful hearing aid user, or if the person will require extra care and counseling when fitted with hearing aids. The Acceptable Noise Level (ANL) test was designed for this purpose. In a typical 2-3 minute test time, it predicts with 85% accuracy whether a person will be a successful hearing aid user.

## Setup

The recommended setup includes a sound booth with a sound field speaker placed at 0 degrees azimuth to the patient. The test can also be performed with headphones, but the speaker configuration allows the clinician to present both speech and noise to both ears at the same time.

Connect the external CD player to

the left and right external source jacks on the back of the audiometer.

Connect the sound field speaker to the left speaker jack. *See Figure 1.* This test can also be performed with the right speaker, but the input and output selections noted in these instructions will need to be adjusted accordingly.

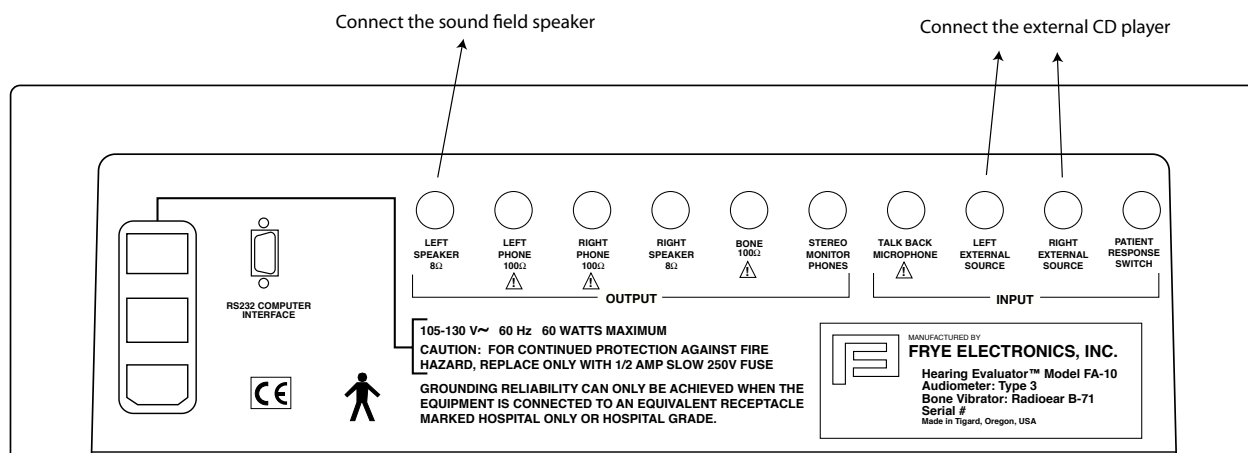


Figure 1: Rear panel of the audiometer

## Calibration

On both the left and right sides of the audiometer, set the

- Output to Speaker,
- Input to External,
- Reverse stimulus to on.

Play track 2 on the ANL CD to calibrate it. Both the left and right external channels need to be calibrated. *See Figure 2.*

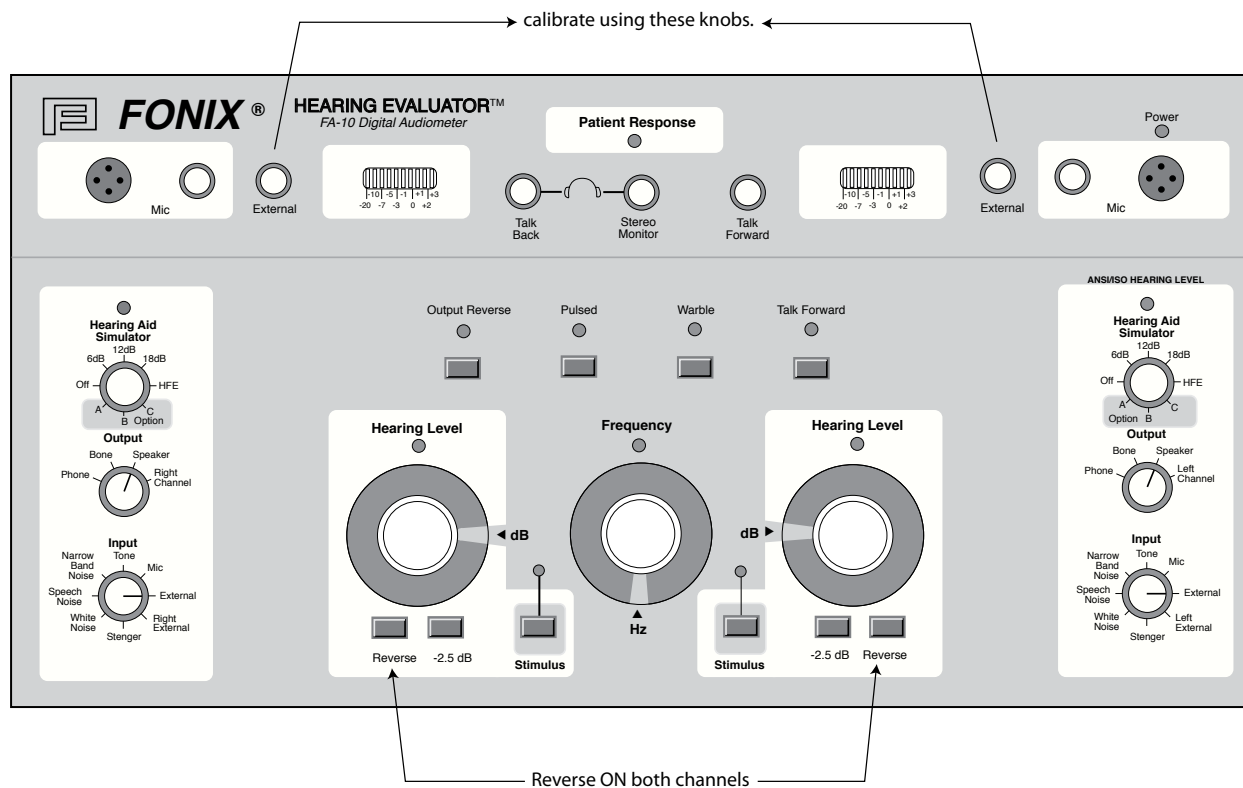


Figure 2: Calibration setup for ANL

## Determine the Most Comfortable Listening Level (MCL)

Before the test, the patient should be given both oral and printed instructions for the two parts of the test. An example of printed instructions is included as an attachment to these instructions for your use. Feel free to copy these instructions and use as needed.

To find the MCL, set the controls on the left side of the audiometer to:

- Output to Speaker
- Input to External
- Reverse stimulus to on.

Set the controls on the right side of the audiometer to:

- Output to Left Channel
  - Input to External
  - Reverse stimulus off (no stimulus)
- See Figure 3.*

1. Set the left Hearing Level control to 30 dB HL.
2. Play track 4 on the ANL CD to play the speech passage.
3. Adjust the left Hearing Level control until the patient signals the speech passage is too loud.

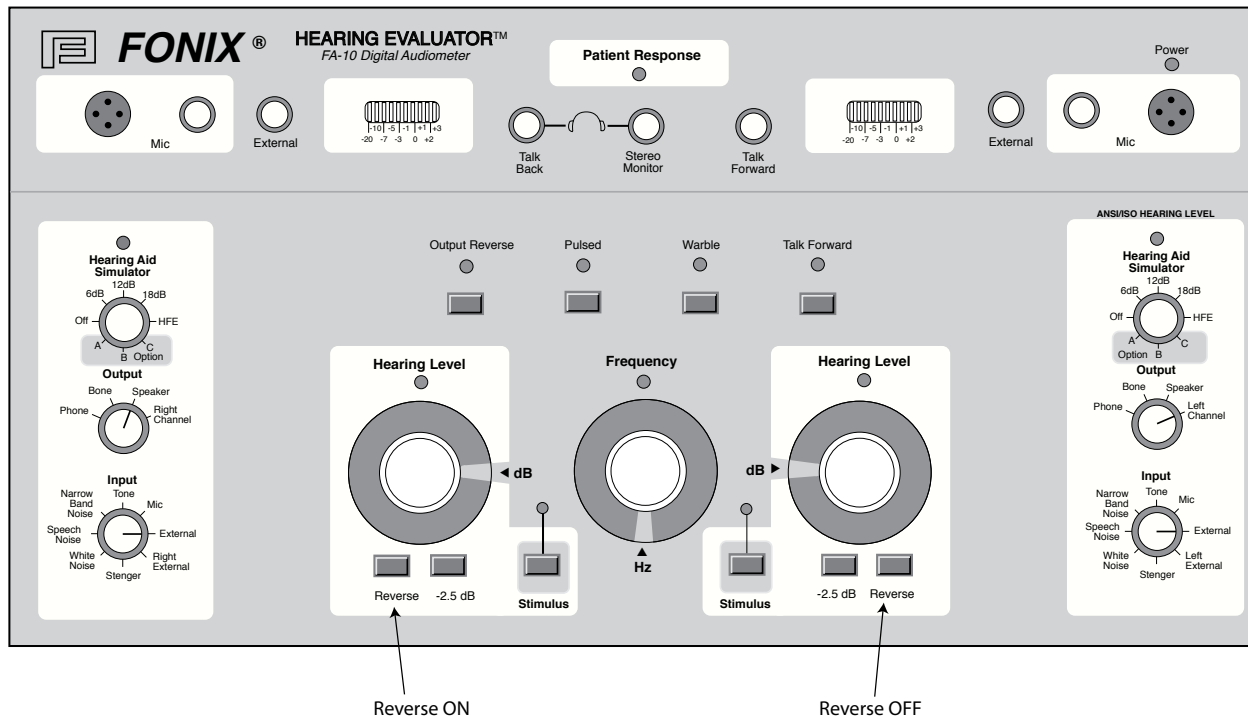


Figure 3: Setup for the ANL test

4. Use 5 dB steps. Adjust the left Hearing Level control until the patient signals that the speech passage is too soft. Use 5 dB steps.
5. Adjust the left Hearing Level control to the patient's most comfortable listening level. Use 5 dB steps for rough adjustment and then use 2.5 dB steps for the final score.
6. Record this level as the MCL.

### Find Background Noise Level (BNL)

1. Keep the left Hearing Level control at the MCL with the stimulus turned on.
2. Set the right Hearing Level to 30 dB HL.
3. Push the right reverse button on the audiometer for continuous output. This adds noise babble to the speech passage.
4. Adjust the right Hearing Level knob upwards until the patient signals the story is incomprehensible. Use 5 dB steps.
5. Adjust the right Hearing Level knob downwards until the patient signals that the story is very clear and easy to understand. Use 5 dB steps.
6. Adjust the right Hearing Level knob until the patient signals that the background is the most that he would want to put up with while listening to the story for a long period of time without getting tense or tired. Use 5 dB steps for rough adjustment and then use 2.5 dB steps for the final score.
7. Record this level as the BNL.

## Determine ANL Prediction

1. Calculate:  $ANL = MCL - BNL$ .
2. Find the ANL score on the graph in *Figure 4* to determine the

patient's probability of successful hearing aid use. This prediction has an 85% accuracy.

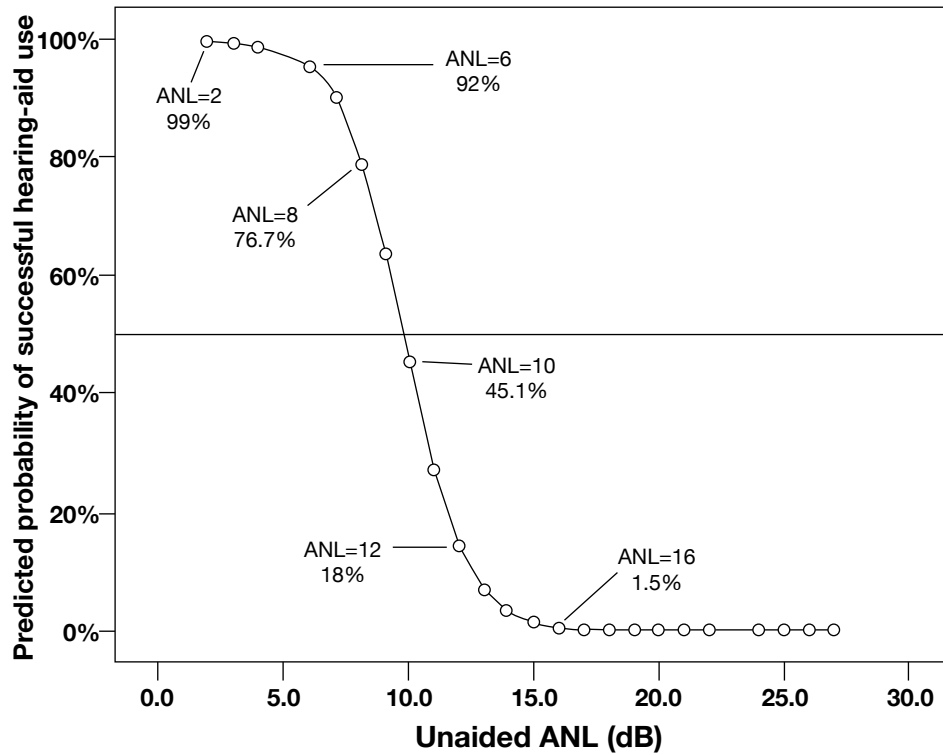


Figure 4: To determine probability of hearing aid success, find the patient's ANL score on the "S curve". Then locate the corresponding probability on the y-axis.



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# INSTRUCTIONS FOR DETERMINING ACCEPTABLE NOISE LEVEL (ANL)

**Purpose :** This test is used to find out how well you tolerate noise within a speech signal.

## **Part 1: Finding your Most Comfortable Level (MCL)**

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You will listen to a story through a loudspeaker. First, we will turn the volume up until you signal that the story is too loud. Then we will turn the volume down until you signal

the story is too soft. Finally, we will adjust the signal until you tell us the signal is the loudness level most comfortable for you.

## **Part 2: Determining the Background Noise Level (BNL)**

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You will listen to the same story with background noise of several people talking at the same time. First, we will turn up the noise level until you signal that the noise is too loud for you to understand the story. Then we will turn down the noise

level until you signal that you can understand the story very clearly. Finally, we will adjust the noise to the MAXIMUM level that you would be willing to “put up with” for a long time while following the story.

**That's it! The entire test should take about 2-3 minutes.**



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