



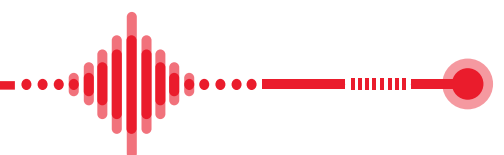
Measure the ear response with an insert headset or a button receiver

STEP BY STEP **RECD Guide**

Real Ear to Coupler Difference

The RECD task involves 4 steps:

- 1 - Calibrate the Probe Tube
- 2 - Measure an Ear Response
- 3 - Perform a Coupler Measurement
- 4 - Apply the RECD Data to your Hearing Aid Fitting



The Real Ear to Coupler Difference (RECD) is used to simulate real ear measurements by coupler measurements and is useful when fitting children or difficult to fit patients



STEP 1 Calibration

Probe Tube Calibration

In the REM software, choose the Real Ear function and go up to Tools in the top tool bar and select *Calibrate Probe Tube*.

Place the tube in the V-notch (which is located on the illuminated portion of the probe microphone). This V-notch will hold the tube in place for calibration. The tip of the tube should be lying directly over the top of the reference microphone in the center.

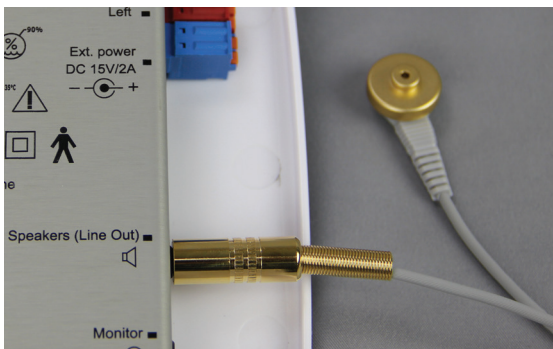
Hold the probe microphone roughly one-half to one meter (19-39") from the speakers.

Click *Start* to run the calibration. If using the REM+ or ARC system, do this for both the right and left probe.

STEP 2 Measure

Method to measure the Ear Response:

Ear Response with an Insert Headset or Button Receiver



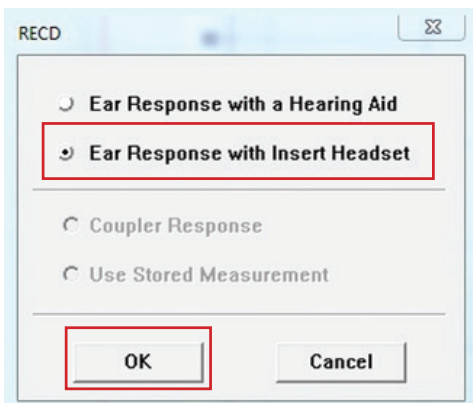
Plug the Button Receiver into the port labeled Speakers on the REM+ or ARC system. For the REMsp, plug the Button Receiver into the speaker port located at the base of the hardware.



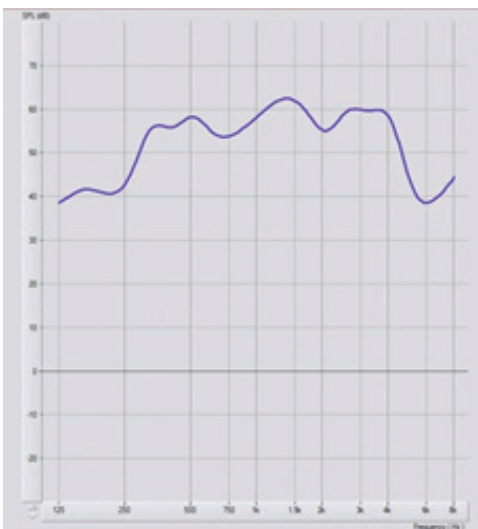
- Place the probe microphone tube as for all REM measurements, add an ear tip to the Button Receiver and use the Button Receiver instead of a hearing instrument.



- Select the green *Start* button to open the measurement type selection screen.



- Choose the *Ear Response with Insert Headset* option
- Select *OK* to begin the test and wait until it completes.



Once the Ear measurement is complete (whether with a Hearing Instrument or with a Button Receiver), you are prompted to perform a Coupler Response measurement.



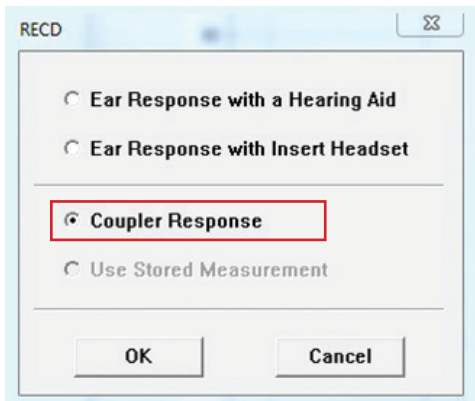
STEP 3 Coupler Measurement

Measure a Coupler Response: Using an Insert Headset or Button Receiver

NOTE: It is important to be consistent with the method used for obtaining the ear response. If the ear response was measured with a hearing instrument, use a hearing instrument for the coupler response. If an Button Receiver was used for the ear response, be sure to use the Button Receiver for the coupler response as well.

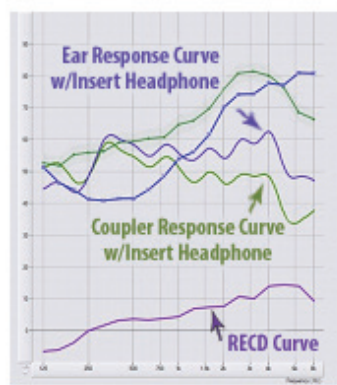
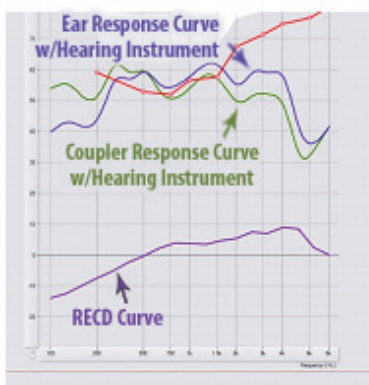
Coupler Response with an Insert Headset or Button Receiver

- Verify the Button Receiver is plugged into the Speakers port on the REM+ or ARC system or plugged into the speaker port of the REMsp system located at the base of the hardware.
- For the Button Receiver, remove the ear tip and place on the coupler using the body aid coupler attachment piece.
- For the REM coupler, insert the probe tube via the hole on the side of the coupler.
- Select *Start* to open the measurement type selection screen.



- Choose the *Coupler Response* option. If an RECD Measurement curve has already been established from a previous session, select the *Use Stored Measurement* option if you wish to use that data.
- Select *OK* and wait until the test completes.

NOTE: If the Ear Response and the Coupler Response were measured with the Button Receiver, the program saves the coupler response curve for later use. In this case to obtain another RECD, only Ear Response with insert headphone measurement is necessary. This is possible because the coupler response does not change provided that neither the coupler nor the insert earphone has changed.



- The calculated RECD curve is automatically displayed on the screen and is stored in memory for correction of subsequent coupler measurement made from the RECD function. The RECD curve is calculated based upon the Ear Response and the Coupler Response. Simply stated, the RECD curve is the difference between the Ear Response and the Coupler Response.



Coupler Response in a Test Box

- Attach the hearing instrument (must be the same one as in the Ear Response test) to the box coupler.
- Close the box lid tightly.
- Select the *Box Coupler* button.
- Select *Start* to open the measurement type selection screen.
- Choose the *Coupler Response* option or *Use Stored* to skip the measurement.
- Select *OK* and wait until the test completes.
- The calculated RECD curve is automatically displayed on the screen and is stored in memory for correction of subsequent test box measurements made from the RECD function.

How is the RECD used?

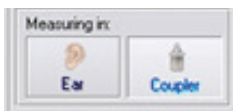
The RECD values are used as a correction to coupler measures for a client's hearing instruments.

By performing all subsequent measures in the coupler and applying the RECD corrections to the coupler measures, the real ear factors are incorporated into the results.

The resulting simulated measurements provide information to select and make adjustments to the hearing instrument and verify adjustments in the coupler (or the hearing instrument test box) rather than in the uncooperative client's ear.

This is particularly important in the case of children, whose small volume ear canals enhance high frequency amplification more so than in average adults. This is an essential consideration in determining the maximum output of the hearing instrument.

If RECD data is present, the software will display an option on the right side of the screen to choose



between Ear or Coupler measurement on all Real Ear screens where measurements in a coupler are

appropriate. Again, the coupler measurements can be performed in a REM coupler or in a test box (if available)

What do you do with the RECD data?

Once the RECD data is calculated and a curve is established, the data can then be used in most hearing aid fitting software programs.

Many hearing aid manufacturers have an RECD section within their fitting software and is used when calculating first fit or auto fit programs.

Within the MedRx REM system, the RECD needs to be exported to a data file. This can be accomplished by following the steps below:

1. From the RECD screen, go to *File* then select *Export*.
2. A *Save As* window will pop up.
3. Name your file accordingly and select *Save*.
4. Once you save the file, it will show the data in raw numbers.
5. Place the numbers for RECD Left Ear or RECD Right Ear in the hearing aid programming software in the appropriate locations.

Once the RECD data is recorded in the hearing instrument fitting software, run the first fit or auto fit feature.

Once the hearing instrument is programmed, the program can then be measured against a target using traditional real ear measurements or speech mapping within your MedRx REM system.



STEP 4 Apply The RECD Data

How do you apply the RECD data to your fitting?

The hearing instrument should be placed in the coupler and positioned within one-half to one meter (19-39") from the speaker. Place the probe tube inside the coupler (see picture).

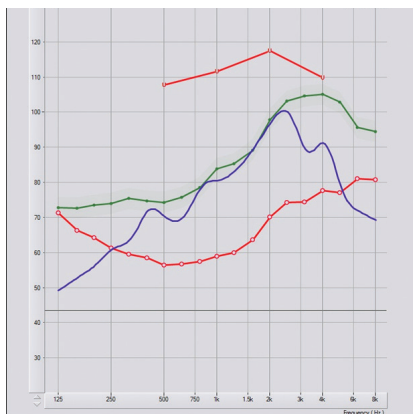
Once the hearing instrument and probe tube are placed in the coupler, a measurement can be taken. In the MedRx REM software, choose the preferred method of measurement, Real Ear Measurement (REM) or Live Speech Mapping (LSM).



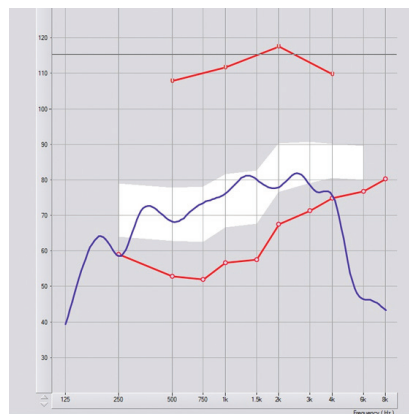
Select *Measuring In: Coupler* at the bottom right of the measurement screen.

Press the green *Start* button to perform your measurement. Compare the outcome to target and make adjustments if necessary in the hearing instrument fitting software. It may be necessary to take multiple measurements if adjustments are made to the hearing instrument.

Below are examples of measurements matching target that were taken in the coupler with the hearing instrument.



Real Ear Measurement matching NAL-NL2 Target at 65dB



Live Speech Mapping Measurement Matching Modified Speech Spectrum at 65dB

Manual Input

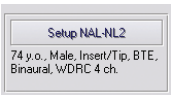
If already known, RECD data can be entered manually. Click *Manual* button, then click on the plot to enter points.

Click *Manual* again to finish entering points

Predicted RECD

RECD can be calculated by prescription rule formulas. Currently only NAL-NL2 is used to calculate RECD data. Select NAL-NL2.

Warning: Predicted RECD calculation depends on many rule parameters, such as patient's age and gender, HI acoustics, insertion depth and venting size. Make sure these parameters are set correctly in the Rule Setup.



To get to the Rule Setup click on the *Setup NAL-NL2* icon on the right hand side.

Example of rule setup screen options

When possible, measuring RECD is preferred over using predicted values

MedRx®

Good Things Come in Small Packages

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Coupler measurements can be performed in a REM coupler or in a test box

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