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## Navigating the MOCR Module

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### Handy Hints

- ⊗ Space-bar or Enter allows you to quickly choose the Default option.
- ⊗ Tab moves through each button to get you quickly to the desired option, if it is not the default or not highlighted.
- ⊗ Right-click on the graphs and status panel to get additional display options.
- ⊗ Hover over the [Key] at the bottom of the screen to get a legend for each graph.

 <span style="float: right;">MOCR Overview</span>	
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## Setting up hardware for the contralateral stimulus

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### Warning

**DO NOT put the earphone into an ear until it is calibrated. The default settings may be inappropriate for your hardware.**

### Hardware

- ⊗ The MOCR module is designed to be used with an external sound card. There are many on the market, and the onus is on you to determine the best for your purposes, and to ensure it is correctly calibrated. Mimosa Acoustics can advise on models we have used and tested. The following advice is of a general nature because the specifics depend on your specific calibration and measuring equipment, external sound card, and earphones.

### Calibration

- ⊗ If you purchase the contralateral hardware through Mimosa Acoustics, the calibration factors can be calculated for you at the factory. You must recalibrate if you change the sound card or earphone.
- ⊗ Set up the sound card according to the manufacturers specifications, and plug it in to the laptop running HearID.
- ⊗ With the sound card plugged in, find the device name. Go to the HearID program folder, and double-click on showdevices.exe. It generates a text file called showdev.txt that lists all available audio devices. Open showdev.txt in notepad, and copy the name of your device exactly into HearID as follows. More than one audio device may be listed.
- ⊗ Run HearID and click on the MOCR Params button.
  - ⊖ In the bottom right of the screen, copy the device name from showdev.txt and paste it into the Audio Device Name field.
  - ⊖ In the bottom left of the screen, set the desired contralateral stimulus parameters.
- ⊗ Plug the earphone into the sound card and insert the tip into an artificial ear connected to a sound level meter, spectrum analyzer, or similar. The specific settings for your SLM are outside the scope of this Help.
- ⊗ Press the "Output CAS" button to output the contralateral stimulus to the nominated audio device. The button should turn yellow and say "CAS off". Press it to turn the CAS off.
  - ⊖ [Trouble-shooting advice if you get an error Audio Device not found](#)
- ⊗ The calibration factor is dB SPL/V. Adjust the factor up or down to compensate for the difference between the target value (60 dB SPL for factory protocols) and the measured value.
- ⊗ Recheck the levels by repeating the above steps. Keep adjusting the factor until you are on target as measured at the sound level meter.

### Hint

- ⊗ If you used the previous contralateral-addon system from Mimosa Acoustics and have the same hardware, you can use the same calibration factors.
- ⊗ While you are first setting up your system, setting the audio device to play through the default Windows speakers can be convenient. Once you know the HearID+MOCR system is outputting a stimulus, change the audio device to your external sound card.

### Warning

- ⊗ Depending on your hardware and how you have set it up, the

contralateral output channel may be affected by the volume settings on the computer, and may also transmit windows event sounds. Refer to your audio device and computer manuals to control and/or disable these settings.

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## Setting MOCR Protocols & Parameters

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### MOCR Protocols

MOCR parameters are saved as named protocols. HearID+MOCR ships with at least two examples - one for TEOAE-based and one for SFOAE-based MOCR measurements. Use these protocols as a basis for making new protocols. Optimal parameters for MOCR tests for clinical use are still in development. This is a research-only system, and the parameters for its use are the onus of the researcher to determine.

#### TE50\_B2000\_N60

This TEOAE-MOCR protocol is similar to that used in [Marshall et al. \(2014\)](#) but is further refined based on subsequent research. It uses a 50 dB SPL Shera chirp stimulus, OAE stopping rules, and a 0.5-2 kHz analyzing band. This analyzing band was shown to have good statistical properties. The contralateral stimulus is a broadband noise at 60 dB SPL. The TEOAE measurement is made in non-linear mode.

#### TE47\_B500\_N60

This TEOAE-MOCR protocol is similar to that used in [Marshall et al. \(2014\)](#) but is further refined based on subsequent research. It includes the 1-1.5 and 1.5-2 kHz analyzing bands, which were shown to be supoptimal statistically, but which might be useful for comparison work so they are included here. The protocol uses a 47 dB SPL Shera chirp stimulus and OAE stopping rules. The contralateral stimulus is a broadband noise at 60 dB SPL. The TEOAE measurement is made in non-linear mode.

#### SF\_1kHz\_N60

This SFOAE-MOCR protocol is similar to that used in [Marshall et al. \(2014\)](#) but is further refined based on subsequent research, including using OAE stopping rules. The contralateral stimulus is a broadband noise at 60 dB SPL. 1kHz is not necessarily the optimal stimulus frequency for any given ear. Create further SFOAE protocols for other frequencies by editing the SFOAE parameters and resaving them with a new name.

### MOCR protocols have two parts

- ⊗ An OAE protocol, specifying the parameters for each OAE measurement.
- ⊗ MOCR parameters which control the timing of the OAE measurements, the nature of the contralateral stimulus, and the quality of the derived MOCR strength.
- ⊗ The same OAE protocol can be linked to multiple MOCR protocols.

### To set up a new MOCR protocol

- ⊗ Choose either an existing OAE protocol (in the OAE protocol panel of the MOCR parameter window) or make a new one by selecting an OAE protocol close to what you want and pressing Edit to open the OAE parameter window.
  - ⊖ Modify the OAE parameters as desired.
  - ⊖ Save the OAE protocol with a new name.
  - ⊖ If you have OAE protocols that you use with your TE or SF module and you would also like to use them in MOCR, contact Mimosa Acoustics to get them added to the available OAE protocols within MOCR. Alternatively, copy the parameters manually.
  - ⊖ For help with OAE parameters, refer to the [SFOAE](#) and [TEOAE](#)

manuals for the details.

- ✿ Modify the MOCR parameters (as described below) to the desired settings.
- ✿ Ensure the desired OAE protocol is selected.
- ✿ Enter a name for the MOCR protocol and choose "Save As".
  - ✦ To overwrite an existing protocol, enter the desired protocol name. You will be prompted to confirm overwriting.
- ✿ As soon as a MOCR protocol is modified, its name changes to "not\_saved" to indicate it has changed. If you choose identical parameters to an existing protocol with the new name, you will be asked if you wish to rename the old protocol with the new name. You cannot save identical protocols with two different names.
- ✿ You cannot make measurements with an unsaved MOCR or OAE protocol.

### Contralateral Stimulus Parameters

- ✿ **Contralateral Stimulus Level (dB SPL):** In this version of the MOCR module, the target level is achieved through an coupler calibration. This represents the level in an average ear.
- ✿ **Stimulus Type:** either noise or sine
  - ✦ noise: 10 kHz broadband noise, filtered with a lowpass Butterworth filter (500 Hz transition band, n=18, zero-phase) applied with Matlab's filtfilt function.
  - ✦ sine: single tone at specified frequency
- ✿ **Sine Frequency:** in Hz

### MOCR Sequence & Timing Parameters

- ✿ **Sequence:** string sequence of characters 'Q' and 'N', representing the sequence of trials without and with a contralateral stimulus. In this version of the MOCR module, only the sequence 'QN' is supported because all the derived MOCR strength measurement assume this sequence. A 'QN' sequence is also referred to through-out as a 'trial-pair'.
- ✿ **Sequence repetitions in series:** number of Sequence (trial-pair) repetitions before automatically finishing. During data collection, you can always collect more repetitions if desired, even after the trial series has finished. You can also terminate the trial series early.
- ✿ **Onset Delay:** minimum delay (seconds) between turning on contralateral stimulus and starting the OAE measurement. Default=2s. This ensures the efferent system is active and at steady-state.
- ✿ **Offset Delay:** minimum delay (seconds) between turning off the contralateral stimulus and starting the next Q measurement. Default=10s. This ensures the efferent system is back to baseline before starting the next trial otherwise the Q OAE could be modified by residual efferent activity.
- ✿ **Time limit for sequence:** maximum time in seconds between the end of the Q trial and the end of the N trial in the trial sequence. If too much time elapses between trials in the trial-pair, the derived MOCR value may be contaminated by time-varying causes unrelated to the efferent system (e.g., measurement drift).
- ✿ **Maximum time for MOCR series:** maximum time in minutes for the entire MOCR series. Series terminates once time is reached. Not implemented in this version of the MOCR module.

### Quality Control Criteria

Test points meeting these criteria contribute towards the summary MOCR statistics and are displayed on the graphs as solid (rather than open) points.

- ✿ **Minimum MOCR SNR (dB):** the signal-to-noise ratio defined as the difference between the raw MOCR strength in dB SPL relative to the MOCR noise level in dB SPL.
- ✿ **Maximum MOCR Noise (dB SPL):** derived from the noise level of the two OAE measurements contributing to the MOCR calculation.
- ✿ **Maximum MOCR CI (%):** maximum 95% confidence interval

(displayed as error bars) on the MOCR% plot. Derived from a Gaussian error propagation and is considered experimental in this version. Set to ~150% to essentially disable.

- ⊗ **Minimum OAE SNR (dB):** minimum OAE SNR for band-analyzed TEOAEs or single-frequency SFOAEs. This criterion can be different to the OAE SNR criterion used for OAE stopping rules.
- ⊗ **Maximum OAE Noise (dB SPL):** maximum OAE noise level for band-analyzed TEOAEs or single-frequency SFOAEs. This criterion can be different to that used for OAE stopping rules.
- ⊗ **Maximum WB Noise (dB SPL):** maximum wideband (whole response) OAE noise level for TEOAEs.
- ⊗ **Maximum Stimulus Level Tolerance (dB):** Maximum deviation of stimulus level from target. Recommended 3dB. Can be used to override criterion used during data collection (3dB).
- ⊗ **Maximum Stimulus Level difference (dB):** (SFOAE only) Maximum difference of levels at fp and fs from target. Recommended 3 dB. (e.g., if targets are 40 and 60 dB SPL, the target stimulus level difference is 20 dB. If the actual levels are 38 and 62, the actual difference in level is 24 dB, which is 4 dB from target difference).

In the factory-default protocols, the MOCR-based quality control criteria are set to extreme values so they are not applied. [Marshall et al. \(2014\)](#) found that it is more expedient to apply quality control to the OAE tests instead. If the first OAE trial doesn't meet quality, the trial-pair can then be terminated early. If MOCR criteria are used, the second OAE trial is needed before making that determination.

### Local Hardware Settings

These settings are not saved to the individual protocols, but are global settings for your system. They are saved in the file *mocrHardware.cfg*, found in the HearID program folder. Either the file can be edited directly, or the settings modified through the parameter interface.

- ⊗ [Read how to set-up and configure the contralateral hardware.](#)
- ⊗ Use the "Output CAS" button to toggle the contralateral stimulus on and off when establishing the calibration factors and to test that the output is working.
- ⊗ **Calibration factor - noise (dB SPL/V).** This factor must be determined for the specific earphone in an artificial ear (e.g., DB100, B&K4157). You need to determine the calibration factor for each earphone used with the system, even if it is the same type.
- ⊗ **Calibration factor - sine (dB SPL/V).** This factor must be determined for the specific earphone in an artificial ear (e.g., DB100, B&K4157). You need to determine the calibration factor for each earphone used with the system, even if it is the same type.
- ⊗ **Audio Device Name:** enter the Windows name for your external audio device. To find this name:
  - ⊖ Navigate to your HearID program folder
  - ⊖ Double-click on showdevices.exe. This program generates a text file called showdev.txt.
  - ⊖ Double-click on showdev.txt to open it in notepad.
  - ⊖ Select the line describing the driver for your audio device and copy & paste it into the Audio Device Name field.
  - ⊖ If you change which port the device is plugged into, the Windows name may also change. Rerun showdevices to find the current name.

### Other Parameters, stored in *mocrHardware.cfg*

By default, the contralateral noise is 10 kHz low-pass filtered broad-band noise. A different filter can be applied by modifying the settings in *mocrHardware.cfg*. Design the filter in Matlab and save a mat file with structure *filt* and fields *filt.a*, *filt.b* (*a,b* same length and *a(1)=1*). Specify the mat file in *series.filtFileName*. To view the output generated by the filter, turn

debugging on by changing: `series.writeNoiseFile=1`. This outputs the noise to the file *noise.dat* in the HearID program folder.

The parameter `series.nkBuffer` controls the buffer length. Do not modify from `default=1` unless you completely understand the implications of doing so.

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## MOCR Statistics & Plots

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### Status

- ⊗ Measurement review - allows you to view the results
- ⊗ During active measurement - interim plots

### Status Panel

After a measurement, and on measurement review, the status panel shows

- ⊗ Subject name and ear
- ⊗ MOCR and OAE protocol used in the test.
- ⊗ The results for each band.
  - ⊖ The Band column lists the frequency bands evaluated
  - ⊖ The Good column lists the number of trial-pairs out of the total trial-pairs that met quality control criteria
  - ⊖ The MOCR% column shows the average MOCR% strength for those trial-pairs that meet quality control (a "NaN" results means not-a-number and indicates there was insufficient data to make the calculation).
  - ⊖ The Risk column is not used in this version.

### MOCR plots

MOCR results are shown on the right hand side. There is one panel for each frequency band of interest. Three plots are available - right-click on the panel to display the options. The definitions for each MOCR statistic are explained more in the [MOCR definitions section](#).

#### MOCR% plot - default

For each trial pair, the MOCR% is displayed as a turquoise line with round symbols, with 95% confidence interval error bars. Solid symbols indicates the measurement meets quality control criteria. Open symbols indicates the measurement does not meet quality control criteria (and are not included in any averages). A red triangle indicates if a measurement is out-of-range (typically occurring with low-OAE levels or high noise).

If there is an MOCR norms file available, colored normative regions will underlay the data.

#### Raw MOCR plots

Raw MOCR magnitudes (turquoise circles) are displayed along with the OAE magnitudes (green triangles for Q trials and gold triangles for N trials) and noise levels for each (dashed lines with matching colors), all in dB SPL. (In this version, phase is not displayed but can be derived from the data files). Solid symbols are used for those measurements meeting quality control criteria.

#### Box & Whisker plots

Once more than 4 trial-pairs are measured that meet quality control criteria, the box and whisker plot for MOCR% can be displayed. A dark turquoise plot indicates the MOCR% and the light turquoise plot indicates the associated variability. A good measurement should show separation between the two boxes; however, it is not particularly meaningful unless a large number of trial-pairs are measured.

#### MOCR norms

If enabled, colored normative regions are displayed underneath the MOCR% plots.

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## MOCR Definitions

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### MOCR Definitions

- ⊗ MOCR% strength for SFOAEs
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- ⊗ Raw MOCR
- ⊗ MOCR% box & whisker plots
- ⊗ MOCR Norms

#### MOCR Strength (%) for SFOAE-based tests

From [Marshall et al. \(2014\)](#), the normalized SFOAE MOCR% for a single Q-N trial-pair, was defined as

$$100 \left( \frac{|P_N - P_Q|}{|P_Q|} \right)$$

i.e., the magnitude of the vector difference (in Pascals) between the complex-valued OAE measured on the Q trial ( $P_Q$ ) and the complex-valued OAE measured on the N trial ( $P_N$ ), normalized by the magnitude of the OAE measured on the Q trial, and expressed as a percentage.

#### MOCR Strength (%) for TEOAE-based tests

From [Marshall et al. \(2014\)](#), the normalized TEOAE MOCR% was developed analogously to SFOAE-based MOCR by (a) at each FFT frequency, taking the vector difference of the Q and N TEOAE complex spectral densities (in Pascals) to obtain the raw MOCR spectrum, (b) summing the total power in the frequency bands of interest from the raw MOCR spectrum and the TEOAE Q spectrum (i.e., Pascals squared), (c) taking the square root, which makes these rms values, and (d) normalizing by dividing the MOCR total power by the TEOAE Q total power in each band, and expressing as a percentage:

$$100 \left( \frac{\sqrt{\sum |P_N - P_Q|^2}}{\sqrt{\sum |P_Q|^2}} \right)$$

Because there is always some variability between the Q and N trials, MOCR% does not reach its theoretical minimum of 0%. It is possible to obtain MOCR% greater than 100% if noise is high, OAEs are low level, or if there is a large spontaneous OAE present. Typically measurements >100% are associated with very large error. Values exceeding the plot limits are plotted as red triangles to indicate that they are out of range.

#### Raw MOCR Strength

The raw MOCR strength is derived from the vector difference in OAE pressure between the Q and N trial. Its unit is dB SPL. It is highly correlated with OAE amplitude, and is considered a confounded measure of MOCR strength. However, raw MOCR strength can be useful to determine whether a

measurement is good quality by considering the SNR and associated noise level.

Display raw MOCR strength by right-clicking on the right-hand-side plots and choosing Raw MOCR from the menu. Raw MOCR magnitude is displayed along with the OAEs and noise levels. (In this version, phase is not displayed but can be derived from the data files).

The summary report also displays the raw MOCR results.

### MOCR Box & Whisker Plots

If more than 4 trial-pairs meet quality control criteria, a box & whisker plot is available by right-clicking on a plot on the right-hand-side and choosing Box & Whisker. Only points meeting quality control criteria are included.

Two boxes are shown: the blue box represents the MOCR strength distribution. The magenta box represents an estimate of the inherent variability in the measurement, estimated by repairing the Q-N trial pairs as Q-Q and N-N trials (thereby factoring out the MOCR strength and leaving only variability), as described in [Marshall et al. \(2014\)](#).

A reliable MOCR measurement will show the MOCR strength distribution clearly separated from the MOCR variability distribution.

For each box & whisker plot, the box represents the inter-quartile range; the middle bar represents the median; the whiskers extend to the most extreme value within 1.5 times the inter-quartile range; outliers are those points falling outside that range.

The summary report also displays the box & whisker plots.

### MOCR Norms

Normative regions may be displayed on the MOCR strength plot. The number of normative bands, their colors, and values, are all user-settable.

In this version there is the functionality to create one set of norms for SFOAEs and one set of norms for TEOAEs.

The default norms are derived from a set of measurements from 27 adult ears with normal hearing and otoacoustic emissions. These measurements were made by NSMRL and MIT and have yet to be published.

Open the file norm\_SFOAE.dat or norm\_TEOAE.dat, found in the HearID program folder. The columns represent:

- ⊗ Axes: specifies the plot on the right-hand-side of the MOCR module (from 1 up to 3), which represents each frequency band of interest.
- ⊗ MOCR%-lo: the MOCR strength defining the minimum value for the band.
- ⊗ MOCR%-hi: the MOCR strength defining the maximum value for the band.
- ⊗ RGB: three columns representing the RGB color-code triplet.

Use ampersand (%) to make comments in the file. Separate each value with commas.

If you do not wish to display these norms, delete the file contents.



## MOCR data files

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### Data file types

- ⊗ The data for each MOCR measurement series is saved as a Matlab \*.mat file.
- ⊗ \*.mat files may be opened and analyzed in [Mathworks Matlab](#) or in the open source [GNU Octave](#).
- ⊗ Filenames are automatically created in the format:  
14\_L\_MOCR\_20140917163123.mat
  - ⊖ The first number is the unique ID number assigned by HearID.
  - ⊖ The ear is specified as "L" for left and "R" for right.
  - ⊖ "MOCR" indicates the measurement type.
  - ⊖ The datetime stamp is in the order: Year (4 digits), month (2 digits), day (2 digits), hour (24-hour format), minutes (2 digits), and seconds (2 digits).
- ⊗ Data files can be large because they contain not just the MOCR results, but embedded are the OAE results files for each individual trial, and the protocols. (i.e., "everything but the kitchen sink"). This allows research users to reanalyze the MOCR results in different ways.
- ⊗ For convenience, MOCR measurement summaries with statistics and plots are also automatically generated when the data are saved. They have the same filename prefix as the data files and are in pdf format:  
14\_L\_MOCR\_20140924142449\_MOCRsummary.pdf

### Data file contents

Opening an MOCR file in Matlab produces a data structure called "mocr". The following list outlines the contents of this large data structure.

### Parameters and settings

- ⊗ **parsets**: a copy of *all* the MOCR parameter sets saved as named protocols (not just the set used in the current measurement), containing:
  - ⊖ **names**: cell array containing the named protocols
  - ⊖ **mocrprotocols**: a cell array containing structures for the OAE protocol name, the series parameters (sequence, repetitions, on and off delays, contralateral stimulus type, etc), and the MOCR quality control parameters (for both MOCR and OAEs), as shown in the MOCR parameters window.
  - ⊖ **oaeprotocols**: a structure containing the named OAE protocols and their parameters, separately for TEOAE (te) and SFOAE (sf) test types (see the SF and TE user manuals for more details).
  - ⊖ **hardware**: a structure containing the contralateral hardware settings, including the calibration factors and device name.
  - ⊖ **version**: the version of the protocol file format.
  - ⊖ **default** and **current**: ignore
- ⊗ **quality**: contains two structures with the MOCR and OAE quality control criteria used in the test, as shown in the MOCR parameters window.
- ⊗ **OAEmode**: string describing whether TEOAEs ('TE') or SFOAEs ('SF') were used for the test.
- ⊗ **calibARLevel**: the noise rejection level used during calibration in dB SPL
- ⊗ **filename**: string containing the complete path and filename for the datafile.
- ⊗ **protocol**: string containing the name of the MOCR protocol used in the test.
- ⊗ **oaeProtocol**: string containing the OAE protocol used in the test, prefixed by either "TE: " or "SF: " to indicate what type of OAE test it is.
- ⊗ **numRepetitions**: the maximum number of trial-pair repetitions specified in the protocol. The maximum may not be reached, and it can also be

overridden by the tester.

#### Data

- ⊗ **res:** a detailed structure containing all of the OAE test results for the MOCR measurement series. See the TE or SF user manual for documentation.
- ⊗ **res.measActiveSecs:** time in ms of active data collection (excluding pauses)
- ⊗ **MeasurementCalibrationQ:** a structure listing the calibration number used for each Q trial. Starting from 1, the calibration number is incremented on each recalibration.
- ⊗ **MeasurementCalibrationN:** a structure listing the calibration number used for each N trial. Starting from 1, the calibration number is incremented on each recalibration.
- ⊗ **line\_cal\_1\_xdata, line\_cal\_1\_ydata, line\_cal\_2\_ydata:** double arrays containing the calibration data. xdata is the frequencies, ydata is the level in dB SPL. TE measurements only use cal\_1; SF measurements contain calibrations for both channels cal\_1 and cal\_2, and additionally the noise level during the calibration line\_calnoise\_1\_ydata and line\_calnoise\_2\_ydata.

#### Statistics saved in the MOCR file

The following calculations are saved in the data file in double array structures. Each row is a frequency band and each column is a trial-pair. See the [MOCR definitions section for more information on how these values are defined](#).

- ⊗ **strength:** MOCR%.
- ⊗ **strengthQQ:** MOCR% inherent test variability, calculated from adjacent Q trials.
- ⊗ **strengthSEM:** MOCR% standard error of the mean.
- ⊗ **strengthCI:** MOCR% 95% confidence interval, which is  $1.96 * mocr.strengthSE$ .
- ⊗ **diff:** raw MOCR in dB SPL, calculated from the vector difference between the OAE in the Q and N trial, but unscaled by OAE amplitude.
- ⊗ **snr:** MOCR SNR in dB, calculated by subtracting mocr.noise from mocr.diff.
- ⊗ **noise:** estimate of MOCR noise level in dB SPL, calculated as the rms addition of the OAE noise level in Pascals from both the Q and the N trial, converted to dB SPL. On average, it is 3 dB higher than the individual noise floors (noise is variance so it adds).
- ⊗ **isGood:** boolean values indicating which trial-pairs meet the quality control criteria on both the Q and N trials (0=does not meet criteria)
- ⊗ **isGoodQQ:** boolean values indicating which trials meet the quality control criteria on the Q-Q recombination used to estimate variability (0=does not meet criteria). Does not include SNR criteria.
- ⊗ **isGoodQuiet:** boolean values indicating which trial-pairs meet the quality control criteria on the Quiet trials (0=does not meet criteria)
- ⊗ **isGoodNoise:** boolean values indicating which trial-pairs meet the quality control criteria on the Noise trials (0=does not meet criteria)
- ⊗ **quietOAE:** OAE magnitude on the Quiet trials in dB SPL
- ⊗ **noiseOAE:** OAE magnitude on the Noise trials in dB SPL
- ⊗ **NoiseFloorM:** identical to **noise** above
- ⊗ **NoiseFloorQ:** OAE noise floor in dB SPL for the Quiet trial
- ⊗ **NoiseFloorN:** OAE noise floor in dB SPL for the Noise trial
- ⊗ **OutOfRange:** value (usually 96) used for displaying MOCR% values greater than 100% that would otherwise be off the plot - plotted as red triangles. "NaN" indicates value was not out of range.

#### Other values

- ⊗ **winclose, saveddata, control\_stack, isCollecting, isPaused, dostop, suppressoractive, calibOK, n, ndone, Ntrials, iCalib, trialMode, trialTimer, trialActiveTime, noisewarn:** these values are

usually meaningless for data analyses - they describe the state of the MOCR module when the test ended.

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OAE Plots	
 <p><b>Menu</b></p> <ul style="list-style-type: none"> <li>⊗ Help Overview</li> <li>⊗ Navigation</li> <li>⊗ MOCR Overview <ul style="list-style-type: none"> <li>⊖ Hardware setup</li> </ul> </li> <li>⊗ Protocols &amp; Parameters</li> <li>⊗ MOCR statistics &amp; plots <ul style="list-style-type: none"> <li>⊖ MOCR definitions</li> <li>⊖ Data files</li> </ul> </li> <li>⊗ OAE &amp; Calibration plots</li> <li>⊗ Calibration <ul style="list-style-type: none"> <li>⊖ Failed</li> <li>⊖ Stopped</li> <li>⊖ Pressure Null</li> </ul> </li> <li>⊗ Measurement <ul style="list-style-type: none"> <li>⊖ Active</li> <li>⊖ Paused</li> <li>⊖ High Noise</li> <li>⊖ Stimulus Level Off</li> <li>⊖ Time Limit Up</li> </ul> </li> <li>⊗ Finished <ul style="list-style-type: none"> <li>⊖ No Data</li> <li>⊖ Poor Quality</li> </ul> </li> <li>⊗ Error <ul style="list-style-type: none"> <li>⊖ Audio Device</li> <li>⊖ Virus/Firewall</li> </ul> </li> <li>⊗ Copyright &amp; Indications</li> <li>⊗ References</li> </ul>	<p><b>OAE bar plots</b></p> <p>On the left-hand-side of the screen, OAE results are shown during active data collection. The default display shows the OAE magnitude as a bar, in each frequency band of interest. The noise level is also displayed. The bars are color-coded to allow easy interpretation:</p> <p><b>OAE:</b> light green for a good OAE that meets magnitude and SNR criteria (set in the OAE pass/refer and stopping rules parameters); orange for an OAE that has insufficient magnitude or SNR.</p> <p><b>Noise level:</b> dark green for a low noise floor that meets magnitude criteria (set in the OAE pass/refer and stopping rules parameters); brown for high noise.</p> <p>In general, light green OAE and dark green noise indicates a good measurement. The MOCR test may or may not terminate early when these criteria are met - it depends on the overall combination of pass/refer and stopping rules criteria.</p> <p>If more than 3 frequencies are specified in an SFOAE test, only the first 3 are shown. If more than 2 frequency bands are specified in a TEOAE test, only the first 2 are shown plus the wideband result. Stopping rules are applied to all defined bands regardless of whether they are displayed or not.</p> <p>For TEOAE-based tests, if you are in another display mode, right-click on the OAE plots to open the display options menu and choose "Show TE bands" if you want to revert to the default display.</p> <p><b>TEOAE spectrum plots</b></p> <p>Right-click on the OAE plots to open the display options menu. Choose "Show TE spectrum" to display the TEOAE results as a spectrum (identical to the TE module).</p> <p><b>Calibration plots</b></p> <p>While test is paused, stopped, or during measurement review, right-click on the OAE plots to open the display options menu. Choose to display the current calibration or to pull up a list of each trial in case the test was recalibrated part way through.</p>
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 <span style="float: right;">OAE Calibration</span>	
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<p>© Mimosa Acoustics, 2014. MOCR help version 1.0, Nov 2014.</p>	

 <span style="float: right;">Calibration Failed</span>	
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 <span style="float: right;">Calibration Stopped by Tester</span>	
<p><b>Menu</b></p> <ul style="list-style-type: none"> <li>⊗ Help Overview</li> <li>⊗ Navigation</li> <li>⊗ MOCR Overview <ul style="list-style-type: none"> <li>⊖ Hardware setup</li> </ul> </li> <li>⊗ Protocols &amp; Parameters</li> <li>⊗ MOCR statistics &amp; plots <ul style="list-style-type: none"> <li>⊖ MOCR definitions</li> <li>⊖ Data files</li> </ul> </li> <li>⊗ OAE &amp; Calibration plots</li> <li>⊗ Calibration <ul style="list-style-type: none"> <li>⊖ Failed</li> <li>⊖ Stopped</li> <li>⊖ Pressure Null</li> </ul> </li> <li>⊗ Measurement <ul style="list-style-type: none"> <li>⊖ Active</li> <li>⊖ Paused</li> <li>⊖ High Noise</li> <li>⊖ Stimulus Level Off</li> <li>⊖ Time Limit Up</li> </ul> </li> <li>⊗ Finished <ul style="list-style-type: none"> <li>⊖ No Data</li> <li>⊖ Poor Quality</li> </ul> </li> <li>⊗ Error <ul style="list-style-type: none"> <li>⊖ Audio Device</li> <li>⊖ Virus/Firewall</li> </ul> </li> <li>⊗ Copyright &amp; Indications</li> <li>⊗ References</li> </ul>	<p><b>Status</b></p> <p>The calibration stopped.</p> <p><b>Explanation</b></p> <p>You pressed stop.</p> <p><b>Actions</b></p> <p>You may stop an in-the-ear calibration at any time. This gives you a chance to adjust the probe in the patient's ear. However, you cannot resume a partially completed calibration - it can only be restarted. Choose Calibrate to restart the in-the-ear calibration when you are ready to resume.</p>
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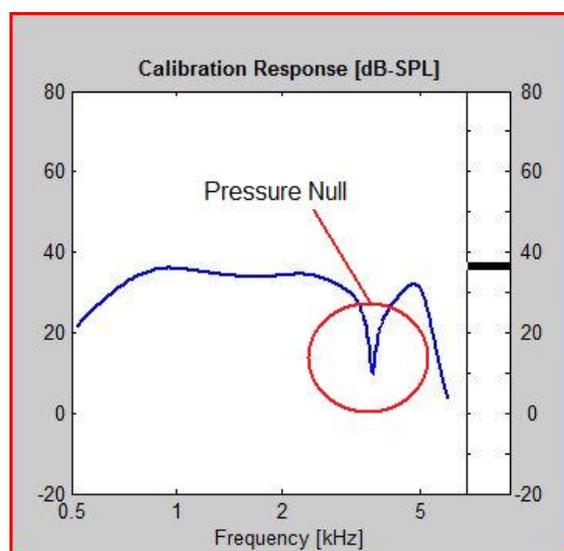
## Pressure Null Detected

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### Status

- ⊗ A pressure null is detected.



### Explanation

- ⊗ Pressure nulls are unavoidable due to standing waves in the closed ear canal. Calibrations around or in the null are not reliable.
- ⊗ It is possible that high noise during calibration can generate a false-alarm about a pressure null. Look at the calibration plot to see if there is evidence of high noise (jitter) in the spectrums.

### Actions

- ⊗ The null can usually be moved to a higher frequency by inserting the probe more deeply into the ear canal.
- ⊗ Aim to get the null to a higher frequency than the highest test frequency in the protocol.
- ⊗ In some ears this is difficult to achieve. If after attempting a better fit, the warning still occurs, choose Ignore. HearID will ignore any further pressure null warnings in the current test session.



## Making MOCR Measurements

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### Overview

- ⚙ Once the system is successfully calibrated, MOCR data collection starts automatically.
- ⚙ A series of OAE measurements (trial-pairs) is automatically made, with appropriate inter-trial delays.
  - ⚙ A trial-pair consists of one regular OAE measurement ('Q' trial, where Q=quiet) and one OAE measurement made in conjunction with a contralateral elicitor ('N' trial, where N=noise).
- ⚙ You may intervene at any time by pressing the Pause button.
- ⚙ At the end of the series choose Finish. A **data file** is created (in Matlab format), and the results are displayed on the screen. Alternatively, choose Cancel to exit without saving.



This screenshot shows an active measurement during the N trial.

### Status Panel

During active measurement the online Help is unavailable. On screen, the status panel shows whether the current trial is Measuring a Q or N trial, the OAE and MOCR protocol names, current trial pair, the number of accepted and rejected averages in the OAE test (bottom left) and the elapsed time for the entire series. It also displays a countdown timer between trials.

### OAE plots

The OAE plots on the left hand side are [described here](#).

### Displayed results

At the end of the test, and on measurement review, the Status Panel shows the average MOCR%, calculated over the trials that meet quality control criteria,

and how many trials met those criteria.

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 <span style="float: right;">Measurement: Active Data Collection</span>	
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Measurement: Paused	
 <p><b>Menu</b></p> <ul style="list-style-type: none"> <li>⊗ Help Overview</li> <li>⊗ Navigation</li> <li>⊗ MOCR Overview <ul style="list-style-type: none"> <li>⊗ Hardware setup</li> </ul> </li> <li>⊗ Protocols &amp; Parameters</li> <li>⊗ MOCR statistics &amp; plots <ul style="list-style-type: none"> <li>⊗ MOCR definitions</li> <li>⊗ Data files</li> </ul> </li> <li>⊗ OAE &amp; Calibration plots</li> <li>⊗ Calibration <ul style="list-style-type: none"> <li>⊗ Failed</li> <li>⊗ Stopped</li> <li>⊗ Pressure Null</li> </ul> </li> <li>⊗ Measurement <ul style="list-style-type: none"> <li>⊗ Active</li> <li>⊗ Paused</li> <li>⊗ High Noise</li> <li>⊗ Stimulus Level Off</li> <li>⊗ Time Limit Up</li> </ul> </li> <li>⊗ Finished <ul style="list-style-type: none"> <li>⊗ No Data</li> <li>⊗ Poor Quality</li> </ul> </li> <li>⊗ Error <ul style="list-style-type: none"> <li>⊗ Audio Device</li> <li>⊗ Virus/Firewall</li> </ul> </li> <li>⊗ Copyright &amp; Indications</li> <li>⊗ References</li> </ul>	<p><b>Status</b></p> <ul style="list-style-type: none"> <li>⊗ Active data collection is paused.</li> </ul> <p><b>Explanation</b></p> <ul style="list-style-type: none"> <li>⊗ You pressed the pause button during a measurement.</li> <li>⊗ Data collection is paused and stimulus output is suspended.</li> <li>⊗ Pressing pause is an excellent way to quickly suspend data collection if you need to quieten or instruct the patient.</li> </ul> <p><b>Actions</b></p> <ul style="list-style-type: none"> <li>⊗ <i>Continue</i> to resume active data collection.</li> <li>⊗ <i>Retest</i> to start the trial from the beginning (recommended if data collected so far is noisy).</li> <li>⊗ <i>Recalibrate</i> if you have adjusted the probe or you suspect the probe may have moved.</li> <li>⊗ <i>Finish</i> if you have collected enough data or you want to review the results so far (you can continue data collection if you wish).</li> </ul> <p><b>Notes</b></p> <ul style="list-style-type: none"> <li>⊗ If you pause/continue during an offset delay, the offset delay continues during the pause. The next Q trial will not start until the minimum offset delay has completed, but the time paused counts towards the delay.</li> <li>⊗ If you pause/continue during an onset delay, the onset delay begins again. The contralateral stimulus is suspended when Pause is chosen. So the onset delay must always complete before the N trial can begin. This ensures the efferent system is in a steady-state before collecting data.</li> <li>⊗ If calibration is re-run on an N-trial, the entire trial pair starts again from the Q trial. This is to avoid large invalid MOCR estimates generated from a change in the phase relationship between the OAEs in the Q and N trial.</li> </ul>
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 <span style="float: right;">Noise Levels too High</span>	
<p><b>Menu</b></p> <ul style="list-style-type: none"> <li>⊗ Help Overview</li> <li>⊗ Navigation</li> <li>⊗ MOCR Overview <ul style="list-style-type: none"> <li>⊖ Hardware setup</li> </ul> </li> <li>⊗ Protocols &amp; Parameters</li> <li>⊗ MOCR statistics &amp; plots <ul style="list-style-type: none"> <li>⊖ MOCR definitions</li> <li>⊖ Data files</li> </ul> </li> <li>⊗ OAE &amp; Calibration plots</li> <li>⊗ Calibration <ul style="list-style-type: none"> <li>⊖ Failed</li> <li>⊖ Stopped</li> <li>⊖ Pressure Null</li> </ul> </li> <li>⊗ Measurement <ul style="list-style-type: none"> <li>⊖ Active</li> <li>⊖ Paused</li> <li>⊖ High Noise</li> <li>⊖ Stimulus Level Off</li> <li>⊖ Time Limit Up</li> </ul> </li> <li>⊗ Finished <ul style="list-style-type: none"> <li>⊖ No Data</li> <li>⊖ Poor Quality</li> </ul> </li> <li>⊗ Error <ul style="list-style-type: none"> <li>⊖ Audio Device</li> <li>⊖ Virus/Firewall</li> </ul> </li> <li>⊗ Copyright &amp; Indications</li> <li>⊗ References</li> </ul>	<p><b>Status</b></p> <ul style="list-style-type: none"> <li>⊗ Noise levels are too high.</li> </ul> <p><b>Explanation</b></p> <ul style="list-style-type: none"> <li>⊗ During data collection, data frames that exceed the current noise rejection criterion are rejected.</li> <li>⊗ If too many frames are rejected, a warning is displayed and data collection is automatically paused.</li> <li>⊗ This gives you a chance to address the causes of the noise.</li> </ul> <p><b>Actions</b></p> <ul style="list-style-type: none"> <li>⊗ Instruct the patient to be quieter. <ul style="list-style-type: none"> <li>⊖ Are they fidgeting, swallowing, clenching their jaw?</li> <li>⊖ Are they breathing noisily? Sometimes opening the mouth can quieten breathing.</li> </ul> </li> <li>⊗ Adjust the probe cable so it doesn't rub against the patient, furniture, or equipment.</li> <li>⊗ If the patient can see the screen, show them the noise bar and ask them to try and keep the noise level below the bar.</li> <li>⊗ Use rubber or foam mats to isolate the probe cable from a vibrating or noisy laptop.</li> <li>⊗ Run the laptop on batteries, not mains power (recommended).</li> <li>⊗ Ensure the ear-tip is inserted fully into the ear canal as this can reduce noise substantially (the foam tip acts like an earplug).</li> <li>⊗ If you are unable to reduce the noise, adjust the noise rejection criterion upwards in ~3dB steps. <ul style="list-style-type: none"> <li>⊖ The higher the criterion, the more noise is let through and the harder it is to achieve the desired signal-to-noise ratio.</li> <li>⊖ For TEOAE protocols, automated noise rejection is enabled. This automatically adjusts the criterion within a prescribed range.</li> </ul> </li> </ul>
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Measurement: stimulus level off-target	
	
<p><b>Menu</b></p> <ul style="list-style-type: none"> <li>⊗ Help Overview</li> <li>⊗ Navigation</li> <li>⊗ MOCR Overview <ul style="list-style-type: none"> <li>⊖ Hardware setup</li> </ul> </li> <li>⊗ Protocols &amp; Parameters</li> <li>⊗ MOCR statistics &amp; plots <ul style="list-style-type: none"> <li>⊖ MOCR definitions</li> <li>⊖ Data files</li> </ul> </li> <li>⊗ OAE &amp; Calibration plots</li> <li>⊗ Calibration <ul style="list-style-type: none"> <li>⊖ Failed</li> <li>⊖ Stopped</li> <li>⊖ Pressure Null</li> </ul> </li> <li>⊗ Measurement <ul style="list-style-type: none"> <li>⊖ Active</li> <li>⊖ Paused</li> <li>⊖ High Noise</li> <li>⊖ Stimulus Level Off</li> <li>⊖ Time Limit Up</li> </ul> </li> <li>⊗ Finished <ul style="list-style-type: none"> <li>⊖ No Data</li> <li>⊖ Poor Quality</li> </ul> </li> <li>⊗ Error <ul style="list-style-type: none"> <li>⊖ Audio Device</li> <li>⊖ Virus/Firewall</li> </ul> </li> <li>⊗ Copyright &amp; Indications</li> <li>⊗ References</li> </ul>	<p><b>Status</b></p> <ul style="list-style-type: none"> <li>⊗ Stimulus level is off-target</li> </ul> <p><b>Explanation</b></p> <ul style="list-style-type: none"> <li>⊗ The probe may have moved in the ear canal, become partially blocked, or have fallen out.</li> <li>⊗ In a Middle-Ear Muscle Reflex (MEMR) test, the contralateral elicitor in an N trial may have elicited a MEMR strong enough to move the stimulus level off target.</li> </ul> <p><b>Actions</b></p> <ul style="list-style-type: none"> <li>⊗ Readjust the probe in the ear canal and recalibrate before continuing with data collection.</li> <li>⊗ Change the ear-tip - it might be partially blocked.</li> <li>⊗ In a MEMR test, rerun at lower contralateral stimulus levels. (In this version of the MOCR module, stimulus level warnings cannot be disabled or ignored).</li> </ul>
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Measurement: time limit for trial-pair reached	
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Error	
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Finished	
 <p><b>Menu</b></p> <ul style="list-style-type: none"> <li>⊗ Help Overview</li> <li>⊗ Navigation</li> <li>⊗ MOCR Overview <ul style="list-style-type: none"> <li>⊖ Hardware setup</li> </ul> </li> <li>⊗ Protocols &amp; Parameters</li> <li>⊗ MOCR statistics &amp; plots <ul style="list-style-type: none"> <li>⊖ MOCR definitions</li> <li>⊖ Data files</li> </ul> </li> <li>⊗ OAE &amp; Calibration plots</li> <li>⊗ Calibration <ul style="list-style-type: none"> <li>⊖ Failed</li> <li>⊖ Stopped</li> <li>⊖ Pressure Null</li> </ul> </li> <li>⊗ Measurement <ul style="list-style-type: none"> <li>⊖ Active</li> <li>⊖ Paused</li> <li>⊖ High Noise</li> <li>⊖ Stimulus Level Off</li> <li>⊖ Time Limit Up</li> </ul> </li> <li>⊗ Finished <ul style="list-style-type: none"> <li>⊖ No Data</li> <li>⊖ Poor Quality</li> </ul> </li> <li>⊗ Error <ul style="list-style-type: none"> <li>⊖ Audio Device</li> <li>⊖ Virus/Firewall</li> </ul> </li> <li>⊗ Copyright &amp; Indications</li> <li>⊗ References</li> </ul>	<p><b>Status</b></p> <p>The MOCR measurement series completed successfully.</p> <p><b>Explanation</b></p> <p>Either the total number of trials as selected in the MOCR protocol has been completed, or you pressed the finish button. The results are shown in the status panel.</p> <p><b>Actions</b></p> <ul style="list-style-type: none"> <li>⊗ <i>Report</i> displays the numerical results and graphs on screen.</li> <li>⊗ <i>Save &amp; Exit</i> writes the data to file and a printed report is automatically generated using the default setting.</li> <li>⊗ Right-click on the right-hand-side graphs to display the raw MOCR and OAE results or a box-and-whisker plot (if more than 4 trial-pairs collected).</li> <li>⊗ Although the set number of trial-pairs is completed, further trial-pairs can be collected by choosing <i>Continue</i> or the previous trial-pair can be rerun by choosing <i>Retest</i>.</li> </ul>
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Finished: no data collected	
	
<p><b>Menu</b></p> <ul style="list-style-type: none"> <li>⊗ Help Overview</li> <li>⊗ Navigation</li> <li>⊗ MOCR Overview <ul style="list-style-type: none"> <li>⊗ Hardware setup</li> </ul> </li> <li>⊗ Protocols &amp; Parameters</li> <li>⊗ MOCR statistics &amp; plots <ul style="list-style-type: none"> <li>⊗ MOCR definitions</li> <li>⊗ Data files</li> </ul> </li> <li>⊗ OAE &amp; Calibration plots</li> <li>⊗ Calibration <ul style="list-style-type: none"> <li>⊗ Failed</li> <li>⊗ Stopped</li> <li>⊗ Pressure Null</li> </ul> </li> <li>⊗ Measurement <ul style="list-style-type: none"> <li>⊗ Active</li> <li>⊗ Paused</li> <li>⊗ High Noise</li> <li>⊗ Stimulus Level Off</li> <li>⊗ Time Limit Up</li> </ul> </li> <li>⊗ Finished <ul style="list-style-type: none"> <li>⊗ No Data</li> <li>⊗ Poor Quality</li> </ul> </li> <li>⊗ Error <ul style="list-style-type: none"> <li>⊗ Audio Device</li> <li>⊗ Virus/Firewall</li> </ul> </li> <li>⊗ Copyright &amp; Indications</li> <li>⊗ References</li> </ul>	<p><b>Status</b></p> <ul style="list-style-type: none"> <li>⊗ The measurement series is finished, but no data has been collected.</li> </ul> <p><b>Explanation</b></p> <ul style="list-style-type: none"> <li>⊗ The Finish button was pushed before a trial pair was completed.</li> </ul> <p><b>Actions</b></p> <ul style="list-style-type: none"> <li>⊗ <i>Continue</i> to collect more data (note if pressed during a Q trial, data collection starts at the N trial).</li> <li>⊗ <i>Retest</i> to restart the last test from the Q trial.</li> <li>⊗ <i>Save</i> to create an entry in the test history list. A data file is saved but contains only the calibration data.</li> </ul>
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Finished: data quality not achieved	
 <p><b>Menu</b></p> <ul style="list-style-type: none"> <li>⊗ <a href="#">Help Overview</a></li> <li>⊗ <a href="#">Navigation</a></li> <li>⊗ <a href="#">MOCR Overview</a> <ul style="list-style-type: none"> <li>⊗ <a href="#">Hardware setup</a></li> </ul> </li> <li>⊗ <a href="#">Protocols &amp; Parameters</a></li> <li>⊗ <a href="#">MOCR statistics &amp; plots</a> <ul style="list-style-type: none"> <li>⊗ <a href="#">MOCR definitions</a></li> <li>⊗ <a href="#">Data files</a></li> </ul> </li> <li>⊗ <a href="#">OAE &amp; Calibration plots</a></li> <li>⊗ <a href="#">Calibration</a> <ul style="list-style-type: none"> <li>⊗ <a href="#">Failed</a></li> <li>⊗ <a href="#">Stopped</a></li> <li>⊗ <a href="#">Pressure Null</a></li> </ul> </li> <li>⊗ <a href="#">Measurement</a> <ul style="list-style-type: none"> <li>⊗ <a href="#">Active</a></li> <li>⊗ <a href="#">Paused</a></li> <li>⊗ <a href="#">High Noise</a></li> <li>⊗ <a href="#">Stimulus Level Off</a></li> <li>⊗ <a href="#">Time Limit Up</a></li> </ul> </li> <li>⊗ <a href="#">Finished</a> <ul style="list-style-type: none"> <li>⊗ <a href="#">No Data</a></li> <li>⊗ <a href="#">Poor Quality</a></li> </ul> </li> <li>⊗ <a href="#">Error</a> <ul style="list-style-type: none"> <li>⊗ <a href="#">Audio Device</a></li> <li>⊗ <a href="#">Virus/Firewall</a></li> </ul> </li> <li>⊗ <a href="#">Copyright &amp; Indications</a></li> <li>⊗ <a href="#">References</a></li> </ul>	<p><b>Status</b></p> <ul style="list-style-type: none"> <li>⊗ Data collection finished but MOCR quality control criteria were not achieved</li> </ul> <p><b>Explanation</b></p> <ul style="list-style-type: none"> <li>⊗ Excessive noise or other measurement problems may have degraded measurement quality.</li> <li>⊗ Patient may not have sufficiently strong OAEs to measure MOCR reliably.</li> <li>⊗ Quality control criteria may be too strict.</li> </ul> <p><b>Actions</b></p> <ul style="list-style-type: none"> <li>⊗ See section on <a href="#">reducing noise</a>.</li> <li>⊗ Review patient's OAEs and hearing levels.</li> <li>⊗ Review if MOCR quality control criteria are appropriate.</li> </ul>
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 <span style="float: right;">Error: Audio Device Not Found</span>	
<p><b>Menu</b></p> <ul style="list-style-type: none"> <li>⊗ Help Overview</li> <li>⊗ Navigation</li> <li>⊗ MOCR Overview <ul style="list-style-type: none"> <li>⊖ Hardware setup</li> </ul> </li> <li>⊗ Protocols &amp; Parameters</li> <li>⊗ MOCR statistics &amp; plots <ul style="list-style-type: none"> <li>⊖ MOCR definitions</li> <li>⊖ Data files</li> </ul> </li> <li>⊗ OAE &amp; Calibration plots</li> <li>⊗ Calibration <ul style="list-style-type: none"> <li>⊖ Failed</li> <li>⊖ Stopped</li> <li>⊖ Pressure Null</li> </ul> </li> <li>⊗ Measurement <ul style="list-style-type: none"> <li>⊖ Active</li> <li>⊖ Paused</li> <li>⊖ High Noise</li> <li>⊖ Stimulus Level Off</li> <li>⊖ Time Limit Up</li> </ul> </li> <li>⊗ Finished <ul style="list-style-type: none"> <li>⊖ No Data</li> <li>⊖ Poor Quality</li> </ul> </li> <li>⊗ Error <ul style="list-style-type: none"> <li>⊖ Audio Device</li> <li>⊖ Virus/Firewall</li> </ul> </li> <li>⊗ Copyright &amp; Indications</li> <li>⊗ References</li> </ul>	<p><b>Status</b></p> <ul style="list-style-type: none"> <li>⊗ HearID cannot find Audio Device</li> </ul> <p><b>Explanation</b></p> <ul style="list-style-type: none"> <li>⊗ The external audio device used to present the contralateral stimulus cannot be found.</li> </ul> <p><b>Actions</b></p> <ul style="list-style-type: none"> <li>⊗ Check the external audio device is connected and powered.</li> <li>⊗ Check that you are using the same USB port - sometimes windows will rename the audio device if it appears on a different USB port.</li> <li>⊗ Check the correct audio device is specified in the Local Hardware Settings panel in the MOCR Parameter window. <ul style="list-style-type: none"> <li>⊖ Open the MOCR Parameter window and verify that the name of the audio device is correct for your computer.</li> <li>⊖ If you want to double-check the device name, go to the HearID program folder, and double-click on showdevices.exe. It generates a text file called showdev.txt that lists all available audio devices. If it is not correct, copy and paste the correct device name into the audio device field.</li> <li>⊖ Alternatively, in Windows, the audio device name can be found by running <i>dxdiag</i> from the Start menu. Choose the Sound 1 or Sound 2 tab and check what is listed as the <i>name</i> in the Device panel.</li> <li>⊖ The name must be reproduced <i>exactly</i> in the MOCR parameter window.</li> <li>⊖ The updated device name is applied to all protocols, but is not saved with the protocol.</li> </ul> </li> <li>⊗ If you are unable to fix the problem please contact Mimosa Acoustics or your vendor.</li> </ul>
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 <span style="color: green; font-weight: bold;">Virus checkers, firewalls, etc</span>	
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## Copyright and Indications

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All patients named in examples are fictitious.

### Indications

The Medial-Olivocochlear Reflex (MOCR) Module is designed to provide stimuli and analysis for rapid measurement and evaluation of the MOCR using otoacoustic emission tests. It is for research purposes only. This software is intended exclusively for clinical investigations.

For HearID Software Version: 5.1

MOCR Manual Version: 1.0

Date: 6 Nov, 2014

Printed in the U.S.A.

References	
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