

AppNote

Checking Room Noise using the RM500

with Software version 2.6

The procedure described in this note will allow you to check the noise level in a room. Because of approximations used in this procedure, levels close to allowed limits should be checked by other means. For continued accuracy, the coupler microphone on the RM500 should be checked regularly using a microphone calibrator. Adapters are available for Quest types QC10, QC20 or CA22.

1. Calibrate the hearing aid test system.
2. Press <ADVANCED FEATURES>.
3. Use the arrow keys to highlight MULTICURVE (if not already highlighted).
4. Press <CONTINUE>.
5. Position the coupler microphone outside the test box (a coupler microphone with a longer cable is available).
6. Press <CONTINUE>.
7. Use the <LEFT ARROW> key to set the stimulus level to 0.
8. Press <CONTINUE> and remain quiet while a curve is run.
9. When CURVE 1 is complete, the RM500 will automatically start CURVE 2. Press <CONTINUE> and remain silent while CURVE 2 is being run.
10. Repeat this process until curves 1 through 5 have been recorded. Then press <CANCEL>.
11. Because background noise changes from second to second, the 5 curves will all be different, but they should generally lie below allowed levels. The RM500 uses a measurement filter with a 1/7 octave bandwidth. Maximum noise levels are often specified for other bandwidths and must be converted for comparison with levels measured with the RM500. This is done as follows:
 - IF MAXIMUM NOISE IS SPECIFIED IN 1 OCTAVE BAND, SUBTRACT 8.5 dB TO GET ALLOWED LEVEL.
 - IF MAXIMUM NOISE IS SPECIFIED IN 1/2 OCTAVE BAND, SUBTRACT 5.4 dB TO GET ALLOWED LEVEL.
 - IF MAXIMUM NOISE IS SPECIFIED IN 1/3 OCTAVE BAND, SUBTRACT 3.7 dB TO GET ALLOWED LEVEL.

OSHA (1983) maximum octave band levels and the corresponding allowed RM500 measured levels for TDH headphone usage are shown in the table below, along with estimates of allowed levels for insert earphone use. **Please note that the insert earphone levels are not recognized by OSHA but have been calculated from data published by the manufacturer and are provided for information only.**

OCTAVE BAND FREQUENCY	500	1000	2000	4000	8000
OSHA MAX NOISE FOR TDH USE	40	40	47	57	62
RM500 MAX NOISE ALLOWED - TDH USE	31.5	31.5	38.5	48.5	53.5
RM500 MAX NOISE ALLOWED - INSERT USE	61	61	58	68	73

Although allowed levels are listed for a specific frequency, they apply halfway (as measured on the printout) to the next listed frequency above and below this frequency as well. An occasional spike above the allowed levels may generally be ignored. An example of an RM500 printout with maximum allowed levels for OSHA compliance is shown on the next page.

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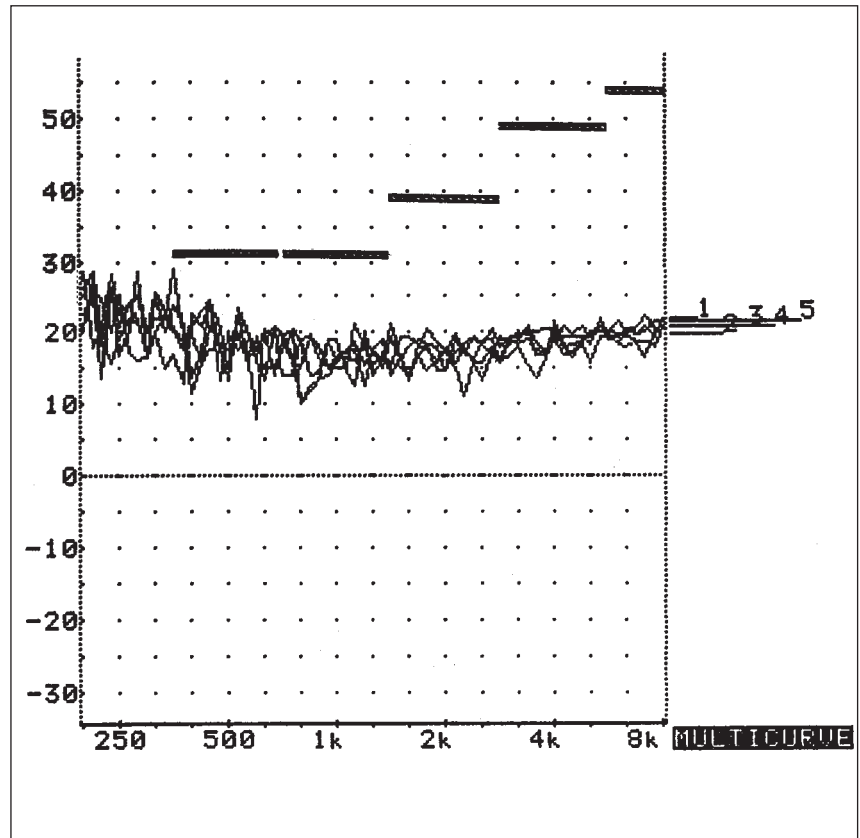


Figure 1: Octave-band ambient noise limits (heavy bars) for hearing tests using TDH headphones (OSHA 1983) added to RM500 printout of room noise. 5 curves measured in quiet room using coupler microphone in HAT Multicurve mode with stimulus level set to 0.