graph), shall be made in order to ensure that the audiometer displays no evidence of distortion, unwanted sound, or other technical problems (*e*) The general function of the audiometer shall be checked, particularly in the case of a self-recording audiometer

(iii) An exhaustive calibration shall be performed at least every five years This shall include testing at all settings for both earphones The test results must prove unequivocally that the audiometer meets for the following parameters the specific requirements stated in the applicable sections of ANS S3 6 as noted in parenthesis (*a*) Accuracy of decibel level settings of test tones (Sections 4 1 4 1 and 4 14 3), (*b*) Accuracy of test tone frequencies (Section 4 1 2), (*c*) Harmonic distortion of test tones (Section 4 1 3), (*d*) Tone-envelope characteristics, i e, rise and decay times, overshoot, "off" level (Section 4 5), (*e*) Sound from second earphone (Section 4 4 2), (*f*) Sound from test earphone (Section 4 4 1), (*g*) Other unwanted sound (Section 4 4 8)

(iv) A record shall be made of each audiometer calibration, and shall include the results of all measurements obtained

(h) **Hearing protector reduction factor "R."** The noise reduction factor "R" of a hearing protector shall be determined by one of the methods in (1), (2), or (3) of this paragraph Method (1) is an exact mathematical method, Method (2) is an approximation using known octave band levels, and Method (3) is an approximation where only the A-weighted level for the environment is known The pure tone attentuation, and standard deviation *vs* frequency characteristics of the hearing protector (normally supplied by the manufacturer) shall have been determined in accordance with ANS Z24 22

(1) *Method 1—Exact reduction factor "R"*

$$R = L_A - 10 \log S$$

where (i) L_A = the A-weighted slow level measured in the environment

(ii) $S = \text{antilog } 0\,1(L_1 - Q_1) + \text{antilog } 0\,1(L_2 - Q_2) + \text{antilog } 0\,1(L_3 - Q_3) + \text{antilog } 0\,1(L_4 - Q_4) + \text{antilog } 0\,1(L_5 - Q_5) + \text{antilog } 0\,1(L_6 - Q_6) + \text{antilog } 0\,1(L_7 - Q_7)$, where

(*a*) Q_1 through Q_7 are defined in dB as

Q_1 = attenuation at 125 Hz, plus 16 2 dB, minus 2 standard deviations

Q_2 = attenuation at 250 Hz, plus 8 7 dB, minus 2 standard deviations

Q_3 = attenuations at 500 Hz, plus 3 3 dB, minus 2 standard deviations

Q_4 = attenuation at 1000 Hz, minus 2 standard deviations

Q_5 = attenuation at 2000 Hz, minus 1 2 dB, minus 2 standard deviations

Q_6 = average of attenuation at 3000 and 4000 Hz, minus 1 0 dB, minus 2 standard deviations

Q_7 = average of attenuations at 6000 and 8000 Hz, plus 1 1 dB, minus 2 standard deviations

(*b*) L_1 through L_7 denote the octave band levels measured in the environment at 125, 350, 500, 1000, 2000, 4000 and 8000 respectively

(2) *Method 2—Approximate reduction factor "R" using octave levels*

(i) Adjust each octave band level to obtain the A-weighted equivalent

(ii) Subtract from each octave band level the mean protection value, adjusted by two standard deviations

(iii) Obtain the overall A-weighted sound level reaching the eardrum by summing the values obtained in (ii) of this subparagraph Addition of these logarithmic values may be conveniently accomplished by a semi-graphical procedure using Figure 1910 95–2

Step	*Action*
(1)	Using the A-weighted octave band levels calculated in (ii) of this subparagraph, subtract the "second highest value" from the "highest value",
(2)	Enter the curve of Figure 1910 95–2 at the point corresponding to the difference value calculated in (1), located on the horizontal scale,
(3)	Follow a horizontal from the point on the curve found in (2) to the vertical scale,
(4)	Add the value found at the vertical scale in (3) to the "highest value",
(5)	Repeat steps (1) through (4) using the