Some new earmuff models have built-in AM/FM radios. When using these earmuffs in industrial settings, doesn’t the radio just add more noise to damage hearing? What are the noise levels under the earcup when the radio is turned on?

When headset radios first appeared in stores several decades ago, they were not marketed as hearing protectors – a good thing, since they offered very little attenuation of noise. At some frequencies, the headsets were even found to amplify background noise (with the radio turned off) due to resonance in the earcup. To be a hearing protector, an earmuff must be designed to be a hearing protector from the start.

The volume settings of typical portable stereo headsets have been measured at 81 dBA at 50% volume setting, 91 dBA at 75% volume, and 96 dBA at 100% volume1 – a hazardous noise level if listened to continuously for several hours. Ideally, a radio headset would allow the enjoyment of music at safe levels, but also reduce the background disturbance in a noisy environment.

Today’s new hearing protectors do just that: built-in radios contain circuitry that limits their radio output. When the radio is turned on (active mode), the sound output is electronically limited to 82 dB. The noise level of the radio will certainly fluctuate (even though there is an 82 dB maximum cutoff in the circuitry, the average noise level of the signal may be much lower). But for the sake of the following example, let’s just assume the worst case radio noise – a constant noise level of 82 dB from the radio – worn in environmental noise of 90 and 100 dB.

When two noise sources are added together, the decibels are added logarithmically, not arithmetically. This means that the sum of two identical sound sources (90 dB + 90 dB) would sum to equal 93 dB. Using a logarithmic calculator,2 let’s determine the effective exposure for 90 and 100 dB of environmental noise, with an assumed 20 dB of attenuation from the earmuff, and constant radio signal of 82 dB:
Since the radio output is limited to a safe 82 dB maximum, the radio adds very little sound energy to effective exposures in high noise levels. In a high-noise job that is also repetitive or monotonous, a radio earmuff can add significantly to worker satisfaction and enjoyment, without sacrificing hearing protection.

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### Footnotes:


2. There are several decibel calculators available on-line, such as http://www.csgnetwork.com/decibelamplificationcalc.html

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WARNING: It does not provide important product warnings and instructions. Bacou-Dalloz recommends all users of its products undergo thorough training and that all warnings and instructions provided with the products be thoroughly read and understood prior to use. It is necessary to assess hazards in the work environment and to match the appropriate personal protective equipment to particular hazards that may exist. At a minimum, a complete and thorough hazard assessment must be conducted to properly identify the appropriate personal protective equipment to be used in a particular work environment. FAILURE TO READ AND FOLLOW ALL PRODUCT WARNINGS AND INSTRUCTIONS AND TO PROPERLY PERFORM A HAZARD ASSESSMENT MAY RESULT IN SERIOUS PERSONAL INJURY, ILLNESS OR DEATH. For further information on this or other hearing conservation topics, contact Technical Support at 800/977-9177. © Bacou-Dalloz Hearing Safety Group