

Let the Music Begin!

The drum roll builds to a frenzied peak, the trumpets blare, the piccolos' highest notes pierce the air—the high school band is practicing. Nothing unusual here. Day in and day out, however, the students and their director are being exposed to potentially damaging levels of noise. Hearing loss is a function of exposure time, the average noise level and peak level of very loud sounds (Fig. 1). A band director in Schaumburg, IL, says, "I have measured a drumline rehearsal at 110 dB—the same as a jet airplane. Add 250 windplayers in a closed space and I knew we had a problem."

Every community has a high school band and maybe even an orchestra that could benefit from hearing protection. Why have these groups ignored hearing protection? Most probably because many people's idea of hearing protection encompasses the "stuff-it-in-your-ear" complete muffling type of ear protection. Most earplugs attenuate or filter more than necessary when fitted properly, and if you are a musician, you want to hear the music—not block it out.

Yet, it is possible to hear the music and be protected from damaging noise levels. One company which offers products which make this possible is Etymotic Research ("etymotic" means "true to the ear"). The company's president and founder, Mead Killion, who is also a musician collaborated with his mentor Elmer Carlson, an engineer, who developed and patented the attenuator used in Musicians Earplugs™ (Fig. 2). Each

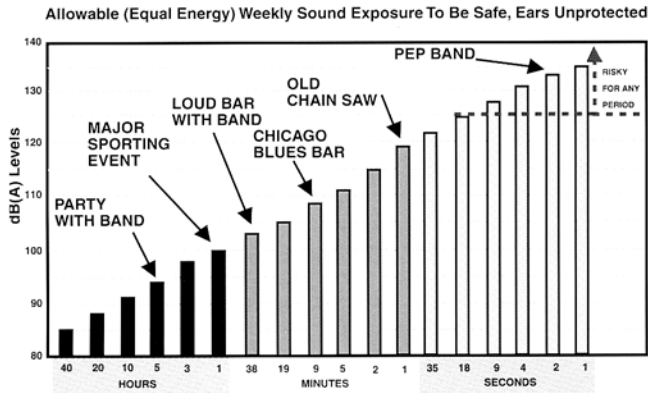


Fig. 1. Safe sound levels involve monitoring exposure time, average noise level and the peak level of very loud sounds.

model of the hearing protectors includes an attenuator which serves to filter incoming sounds and gently reduce the intensity.

The idea was to use a flat-response attenuator with a frequency response that follows the shape of the natural frequency response of the open ear, but at a reduced level. The ER-15 attenuates incoming sounds by 15 dB, while the ER-25 reduces levels by 25 dB (Fig. 3). These ER-15 and ER-25 buttons snap into silicone or vinyl custom earmolds. They can be ordered with filaments for ease of removal.

Both of these models are designed to maintain high fidelity reproduction of music or one's instrument output without compromising listening ability. Music and speech can still be heard clearly, but will not be as loud.

Some musicians found that they did not need as much attenuation as 15-25 dB. The latest Etymotic Research development, the ER-9 Musicians Earplugs™, is similar to the two previous models, however, these earplugs provide only about 9 dB of attenuation. All of the attenuator buttons can be used in the same earmold.

Hearing care professionals, however, may not find high school bands willing to fund custom hearing protection for their members. The ER-20 HI-FI™ Earplugs (Fig. 4) were designed as a lower cost alternative. These use a tuned resonator and acoustic resistor to give flat attenuation. The soft-flanged generic earplugs provide more uniform attenuation than foam plugs and



Fig. 2. All Musicians Earplugs™ buttons can be used in the same custom earmolds.

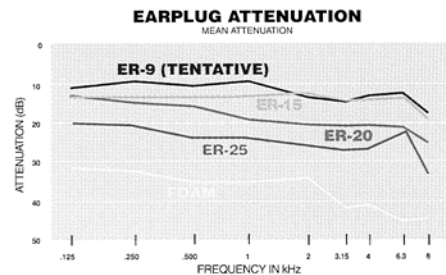


Fig. 3. Earplug attenuation of each of the protection devices.

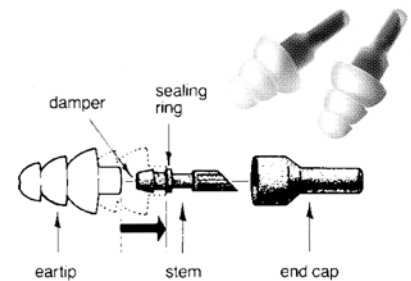


Fig. 4. Diagram of ER-20 earplugs.

their triple-flange tip can be removed and washed. Like the foam earplugs, however, the ER-20s must be inserted properly to get the maximum protection. With the earplugs, ears are protected from unsafe levels by attenuating incoming sounds by about 20 dB; high frequency sounds are not muffled and music is heard clearly. Students and their parents may also find these earplugs useful at basketball games, concert venues or even movie theaters when the audio is really loud like *Godzilla*.

These hearing protection products, available through hearing care professionals, provide an excellent means for demonstrating the need for hearing conservation in one's community. So, let the music begin! ♦

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