



Just the Facts...

War Fighter Hearing Protection: Communication Enhancement and Protection System (CEPS)

CEPS gives Soldiers and Marines Protection from Hazardous Noise, both Steady State and Impulse (Weapons Fire) and at the same time:

Maintains Ability to Locate and Identify Opposing Forces

Maintains Capability to Communicate Face-To-Face

Provides Radio Communication in Noise (Be on the Net)

Is Compatible with Existing Equipment

Soldier Survivability and Situational Awareness.

Soldiers must use all senses to survive and perform on the modern battlefield. While sight is critical to the soldier's ability to perform the mission, they must also use their hearing to detect, locate and recognize the enemy. Combat veterans value hearing as a 360-degree warning sense whereas vision is acknowledged as slightly more than 180 degrees. Soldiers must also communicate face-to-face and via radio in secure modes during mission operations. Operational contingencies, missions and environments, such as night reconnaissance, nuclear, biological and chemical (NBC) defense modes or smoke, dust and haze confound the soldier's ability to perform these tasks. Cave clearing and MOUT operations are particularly hazardous to hearing. These are situations where subtle sounds must be heard yet hearing protected from expected and unexpected blasts. In addition, hazardous noise from small arms, artillery fire, armored vehicles and aircraft can result in an inability to hear for hours even days and eventually become a permanent hearing loss.

The CEPS Solution. The CEPS allows an individual to listen to ambient (surrounding) sounds that are translated from their original (absolute) levels to levels that are more optimal for communication and protection. For example, the user may translate sounds to a higher level for improving detection of very low-level ambient sounds. Conversely, the user can translate high level, hazardous sounds into lower levels that are considered safe for hearing. Microphones are placed at or near each ear to preserve the localization capability (ability to determine direction of incoming sound). Sound signals are processed separately to maintain the fidelity of the sounds received. This configuration attempts to emulate the normal reception of sound when hearing protection is not worn. In addition, a pair of momentary contact switches can either increase or decrease the electronic output gain to control the reception and amplification of external sound. Increased gain permits the user to maximize his sound detection ability during watch or lookout activities without compromising his position to an enemy. The CEPS is coupled with expanding foam earplugs which act as a barrier to reduce hazardous noise and serve as a channel for essential sounds to be transmitted past the occluded (plugged) ear.

Field Tested. The 160th Aviation Regiment (Night Stalkers) procured and deployed the helmet version of the CEPS for aviation combat operations in Afghanistan and Iraq. The CEPS was needed for air crews when they were required to egress their air craft to conduct ground operations. With the CEPS they were able to retain their aviator helmets and its mounted NVG sight systems, lip lights and hearing protection while staying on the net and maintaining face-to-face communication ability.

Hearing Conservation

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Hearing Protection Available. The amount of noise reduction (protection achieved) will depend on how well the user inserts the Comply™ foam ear tips. The foam tips are available in 3 sizes. However, use of the short size is discouraged because of the lower performance and less retention in the ear canal. Noise reduction potential for these earplugs is shown in the Table below. Results for the “real world fit” are generally less, but appropriate size selection and user training in a proper roll down and insertion technique improves the noise reduction achieved.

Configurations Available. The CEPS can be used in headband, recon or helmet configurations. See Figures. The infantry version includes headband and modular configurations. A radio interface allows for communication under stealth conditions as well as in the back of a Bradley or in a helicopter. The low profile device including two AAA batteries only weighs 2.2 ounces. The helmet configuration uses the lip light battery power supply.



Band



Recon



HGU-56/P with CEPS

Ordering. National stock numbers are not available at this time. The beginning price for the Infantry version (Band and Recon) is \$275 which is expected to drop as the production process is streamlined for this new product. Orders should be placed directly to the manufacturer:

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Table. Real-Ear Attenuation Characteristics of the CEPS per ANSI S3.19.-1974 Using Standard and Slim Size Comply™ Foam Tips. Noise Reduction Rating (NRR) is 29.5.

Test Frequency (Hz)	Mean Attenuation (dB)	Standard Deviation (dB)
125	29.7	5.3
250	34.2	5.9
500	39.7	4.7
1000	42.1	5.1
2000	38.0	3.2
3150	43.2	3.2
4000	43.5	3.5
6300	47.5	4.5
8000	46.1	4.4

References.

Ahroon, W. A., “War Fighter Hearing Protection,” Briefing to DOD Hearing Conservation Working Group, 22 April 2004, Aberdeen Proving Ground, Maryland.

Mozo, B., email message to D. Ohlin, 10 May 2004, Subject: CEPS.

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