

Aviation

Tech Tips

United States Department of Agriculture
Forest Service



**Technology &
Development Program**

May 1991

5700

9157 1304

Two New Aviation Hearing Protectors

by Richard Young—Engineering Aid

If you work at an air base, or in any environment that involves frequent or continuous exposure to aircraft, then you should be concerned about your hearing. The purpose of this publication is to inform you about two new products which can be used to **protect your hearing**.

FOR HELITACK OPERATIONS

A Forest Service study of helicopter noise found that sound levels inside helicopters during operation are loud enough to cause significant damage to unprotected ears if continued over a long period of time. Further, ground crew station noise is loud enough to cause irreversible hearing damage with exposures of as little as 2 hours per day in some people, and will certainly cause irreversible hearing damage to most people exposed for 8 to 10 hours per day. Anyone exposed to helicopters during landing, hover, or takeoff at distances as great as 200 feet for more than 4 hours per day will exceed safe noise limits. Anyone participating in retardant loading or unloading will be exposed to noise levels which will damage their hearing.

As a general rule, if the background sound in an area is loud enough to cause you to raise your voice to be heard by a listener who is no more than 3 feet away, the sound level exceeds the maximum level tolerable without protection. An important finding was that aircraft produce a large amount of energy concentrated in the lower frequencies, the same used in ordinary speech. For this reason the use of hearing protection would make vocal communication neither worse nor better.

Hearing protectors are available in three categories: Ear plugs, earmuffs, and noise attenuating aviation headsets or helmets. All helitack crew members should be issued ear plugs; ground

crew persons should be issued both ear plugs and ear muffs, and their use should be mandatory. Anyone working for more than 1 to 2 hours per day within 200 feet of helicopter operations should wear hearing protectors of some type. Those who wear headsets should be aware of the volume control setting and the particular headset's hearing protection characteristics. An intercom operated constantly at full volume can be loud enough to cause serious hearing damage. Specific sources for ear plugs and ear muffs and an evaluation of their effectiveness can be found in *Equip Tips* 7951 1304, "Protect Your Hearing!" revision No. 2, November 1979.

EARMUFF WITH CHIN STRAP

Recently an inexpensive earmuff was made available which provides adequate protection, and is available through the General Services Administration (GSA). The Safety Direct earmuffs are inexpensive and ideally suited for aviation-related uses because they include a provision for a chin strap tie down. The chin strap aids in keeping the muffs effective even in prop wash or rotor blast. The earmuffs are lightweight and comfortable. They use a spring-steel headband that rotates fully around plastic cups, allowing three position use: Overhead, behind head, and under chin. The overhead position is recommended because it achieves the greatest attenuation; a noise reduction rating of 25 dB. The plastic cups have foam-filled cushions for a close and comfortable fit. The Safety Direct earmuffs (fig. 1) are available from:

Silencio
56 Coney Island Dr., Bldg.No. 22
Sparks, NV 89431
800/648-1812; FAX 702/359-1074.



Figure 1. Safety Direct earmuff with chin strap.

Presently, the muffs cost \$6.07 each. They are available as NSN 4240-00-022-2946 in the GSA catalog.

BUMP CAP KIT

The hearing *and* bump protection needs of flight crews involved in low-level missions have been provided for by the introduction of a bump cap by the David Clark Company. Most Forest Service aviators use David Clark aviation headsets. The K-10 bump cap is compatible with all the David Clark two-ear headsets. The bump cap/headset assembly (fig. 2) provides for head impact protection, as well as hearing protection. The result is normal communication in high noise, bumpy environments as encountered in aerial fire fighting and other low-level flight activities. The series K cap kits consist of a shell, nape pad (to protect the neck), and lightweight liner. The combined weight, including a headset, is 42 oz. The headsets are easily installed into or removed from the bump cap. Attachment points are provided for breathing masks and visors or face shields.

The David Clark bump cap is *not* a substitute for an aviation helmet. It may not be used in those operations which require an SPH-4, for instance. However, it should be considered by lead plane pilots, infrared pilots, etc. when a "real" helmet is impractical, and some bump protection is desired.

The helmet is tan in color and is constructed of a high-strength, molded-nylon shell and energy absorbing impact pads. The helmet liner is brown and made of cotton/polyester which breathed comfortably in testing. The kit proved to be quite comfortable and absorbed and distributed minor shocks well. The K-10 kit is available from:

David Clark Company Inc.
360 Franklin St.
P.O. Box 15054
Worcester, MA 01615-0054
508/756-6216.

The kit costs approximately \$285.

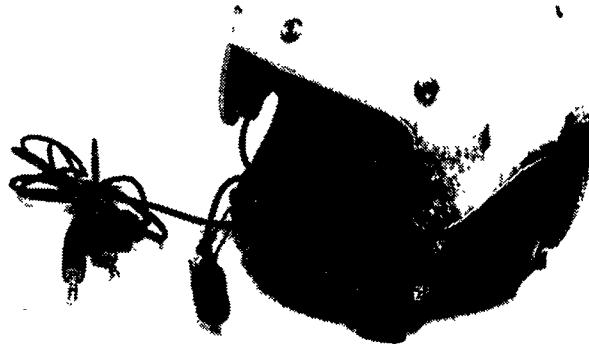


Figure 2. David Clark bump cap/headset assembly.