

DEPARTMENT OF THE ARMY
HEADQUARTERS, 101ST AIRBORNE DIVISION (AIR ASSAULT) AND FORT CAMPBELL
2700 Indiana Avenue, Fort Campbell, Kentucky 42223-5656
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Medical Services
ARMY HEARING PROGRAM

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1. Purpose.

This regulation provides information and outlines the policies of this headquarters for the prevention of hearing loss and the control of noise hazards for military and civilian personnel.

2. Applicability.

This regulation applies to all routinely noise exposed units, organizations, activities, and individuals, military and civilian, assigned or attached to Fort Campbell, KY.

3. References.

See Appendix A.

4. Program authority.

AR 40-5, Preventive Medicine, directs all Department of the Army installations to implement and sustain a viable and effective hearing conservation program for all routinely noise exposed military and civilian personnel.

This regulation supersedes CAM Regulation 40-5 dated 19 August 2005.

5. General.

a. Army Hearing Program. The Army Hearing Program (AHP) represents leadership policies, strategies and processes to prevent noise induced hearing loss among military and Department of Defense (DoD) civilian personnel. The hearing program has four major elements: hearing readiness, clinical hearing services, operational hearing services, and hearing conservation. Good hearing enables a Soldier and/or civilian employee to maintain critical situational awareness and effective voice communication in any environment (i.e. garrison, industrial, training, operational and combat missions). This is accomplished by: 1) preventing both temporary and permanent hearing loss, and 2) improving communication in noise (signal-to-noise or S/N ratio). Civilian personnel will be enrolled in a comprehensive hearing conservation program (HCP) when duties require exposure to hazardous noise or suspected ototoxins (ear poisons). DA Pam 40-501, para 3-3 provides definitions of hazardous exposures. Appendix D provides examples of typical exposures that meet the criteria for enrollment in a comprehensive HCP. All Soldiers, due to military training requirements known to be noise hazardous, are automatically enrolled in the HCP.

b. Hearing loss degrades combat readiness and effectiveness. On today's advanced technology battlefield, Soldiers must be prepared to communicate effectively and perform optimally, which requires essentially normal hearing sensitivity. Good hearing is a proven combat multiplier, preserving the lethality and survivability of the War Fighter.

c. Noise-induced hearing loss is one of the most prevalent injuries among military and civilian personnel, representing a significant portion of the annual cost for service-connected disability compensation. Hearing loss and/or its associated symptoms (i.e.; tinnitus) result in permanent disability, which in most cases is preventable. It is imperative that emphasis on hearing conservation and preventive measures be maintained. The primary goal of the Army Medical Department is Force Health Protection. Hearing loss prevention is consistent with the goal to prevent or eliminate disease and non-battle related injuries.

d. Nuisance noise is defined as any unwanted sound that interferes with communication or the ability to achieve restful sleep periods. It capitalizes on the non-auditory effects of noise, creating stress and fatigue in dangerous combinations for Soldiers and civilians. Acceptable noise levels are task-specific, for example, the amount of tolerable ambient noise is greater for a TOC than for a sleep tent. The presence of unwanted or intrusive noise has been heavily researched and the resulting insights can assist in short and long-term care of the deployed Soldier at all ranks. Preservation of communication ease, including face-to-face briefings or radio communications, *significantly reduces stress levels and increases the operating efficiency* of all personnel. In addition, *sufficient sleep cycles* in the rest areas 1) increases the immune system's ability to fight disease, 2) sustains keen perception ability, and 3) preserves higher mental abilities and motor skills. In essence, an alert, combat-ready Soldier is restored. Finally, nuisance noise common to the Garrison community potentially interferes with hearing warning sirens or emergency signals, potentially jeopardizing the safety of all installation personnel.

e. The essential elements of the Fort Campbell Hearing Program are listed below with general details provided in DA Pam 40-501, chapters 4-10 and FM 4-02.17, Preventive Medicine Services, Appendix C. Procedures and services pertaining specifically to Fort Campbell are provided in the following paragraphs:

- (1) Noise Hazard Identification (para 7).
- (2) Engineering Controls (para 8).
- (3) Hearing Protectors (para 9).
- (4) Monitoring Audiometry & Hearing Readiness (para 10).
- (5) Health Education (para 11).
- (6) Enforcement (para 12).
- (7) Program Evaluation (para 13).
- (8) Operational Hearing Services (para 14).
- (9) Garrison Nuisance Noise (para 15).

Additional Hearing Conservation Services available from LaPointe Health Clinic to installation units are outlined in para 16 with contact information provided.

6. Responsibilities and implementation.

- a. Commanding General, 101st Airborne Division (Air Assault) and Fort Campbell, will--
- (1) Ensure implementation of the AHP by all units and activities under his command in accordance with AR 40-5, and AR 385-10.
 - (2) Issue a command emphasis letter (per AR 40-5) endorsing the Fort Campbell AHP.
 - (3) Include hearing conservation (per AR 40-5) as an item of interest in the local Command Inspection Program (CIP).

(4) Appoint on orders the Brigade Environmental Science Officer as the Noise Hazard monitor and the Brigade Hearing Program Officer.

(5) Provide the IHPM access to the electronic Division Roster, to enable sort routines by UIC, MOS, name, and SSN, who then prepares the roster for the Hearing Program Manager (HCPM).

b. The Director, Health Services, Fort Campbell will--

(1) Facilitate medical surveillance and provide staffing oversight for hearing services afforded to all military and identified civilians exposed to hazardous noise IAW AR 40-5 and DA Pam 40-501.

(2) Appoint on orders a military Audiologist to act as the Installation Hearing Conservation Program Manager with responsibilities outlined in Section f.

c. The Chief, Preventive Medicine Service will--

(1) Submit a quarterly Hearing Readiness report by battalion to the Director, Health Services and to the 101st Airborne (Air Assault) Division Surgeon for the Installation Commander.

d. The Chief, Occupational Medicine will--

(1) Coordinate with the IHPM to identify and maintain a database of all DoD civilians that are exposed to ototoxins and high intensity noise for the AHP.

(2) Schedule and perform placement, periodic, and termination audiometric evaluations on DoD civilian personnel exposed to hazardous noise. Ensure that pre-placement and all baseline audiograms are within four weeks or sooner of assignment to noise hazardous areas.

(3) Notify the immediate supervisor and civilian personnel officer in writing of an individual who has sustained a permanent hearing loss which may endanger that individual and others.

(4) Maintain and provide upon request audiometric testing records for civilians.

(5) Notify the employee and the immediate supervisor, in writing, of a significant threshold shift (STS) on the annual screening exam, any follow-up evaluations, and the requirement to enforce the use of hearing protection devices (HPD).

(6) Refer civilian personnel who fail the second follow-up hearing test to re-establish a valid baseline audiogram with the Audiology/Hearing Conservation Clinic located within LaPointe Health Clinic (LHC).

(7) Ensure audiometric equipment is tested, calibrated, and maintained per OSHA 29 CFR, 1910.95.

(8) Provide appropriately trained personnel to fit DoD civilians with proper size and type of hearing protection devices.

(9) Provide appropriately trained personnel to incorporate hearing conservation education classes in conjunction with ongoing health education as required to promote individual understanding of hearing loss prevention.

e. The IHPM (per AR 40-5 and DA Pamphlet 40-501) will---

(1) Perform sound level and octave band meters and dosimetry surveys of known and suspected noise-hazardous areas and equipment and potential ototoxic exposures as necessary to establish the following:

(a) Range of time weighted averages for civilian or military exposure groups (SEG)

(b) Effectiveness of controls or to define source emissions

(c) Survey within 30 days of any reported changes in equipment or work-site operation

(d) Determine, if not previously identified, if an MOS, wage grade or general service series is commonly exposed to excessive noise in order to define risks to the work populations as an SEG.

(2) Provide technical oversight to brigade ESOs, to include: training to complete industrial noise surveys using the DD 2214, calibration of noise survey equipment, or applying expedient noise controls, personnel exposure and critical communication assessments in atypical environments.

(3) Monitor initial and repeat noise hazard area evaluations performed and by brigade ESOs.

(4) Perform an initial evaluation within 30 days of notification of potential noise-hazardous or ototoxic work sites identified by the safety manager per paragraph i(1).

(5) Identify noise and ototoxic-exposed personnel and the magnitude of the exposure. Provide a survey report with pertinent recommendations for appropriate personnel (commanders, supervisors and safety managers) following initial evaluations, re-evaluations, or upon request.

(6) Establish RACs and forward the noise survey results which indicate a violation to the designated safety and occupational health official for inclusions on the appropriate violation inventory log.

(7) Notify unit commanders/supervisors of any violation reported to the designated safety and occupational health official.

(8) Maintain a current inventory of all noise-hazardous areas using DD Form 2214 (Noise Survey) and/or the Defense Occupational and Environmental Readiness System (DOEHRHS-IH) Data Base as it can accommodate noise information.

- (9) Provide the HCPM with the number of noise-exposed and ototoxic-exposed civilian personnel for the specific calendar year on an annual basis. This is required to determine AHP participation rates.
- (10) Notify the civilian personnel officer of noise hazardous areas for inclusion in job description.
- (11) Make necessary arrangements for obtaining technical assistance and support for noise surveys from the U.S. Army Center for Health Promotion and Preventive Medicine, Aberdeen Proving Ground, Maryland.
- (12) Perform new construction octave band surveys, during the warranty period, to determine if buildings meet noise and vibration United Facilities Criteria.

f. The Installation Hearing Conservation Program Manager (HCPM) manages and coordinates all aspects of the Hearing Program outlined in this regulation. These responsibilities include:

- (1) Draft and staff an installation hearing conservation regulation.
- (2) Supervision of staff providing hearing examination (monitoring audiometry) services for all noise-exposed personnel. Uses authorized Defense Occupational Environmental Health and Readiness System-Hearing Conservation (DOEHRS-HC) audiometric instruments, computers and guidance IAW DA Pam 40-501 Chapter 7.
- (3) Ensure audiometric testing records are maintained using authorized DD Form(s) 2215 and 2216, which are generated by DOEHRS-HC system.
- (4) Ensure notification of appropriate personnel (Commanders, civilian supervisors, safety and occupational health managers) when an individual has sustained a positive significant threshold shift (STS) or permanent hearing loss that may endanger the individual and others. Notification can include the need for STS follow up, a diagnostic evaluation, a DA Form 3349 profile form (with appropriate recommendations for maximum remediation of risks), and/or a written confirmation of a permanent hearing shift. The notification will communicate the requirement to enforce the use of HPD in noise hazardous environments.
- (5) Conduct unannounced inspections of noise-hazardous areas in accordance with Ft. Campbell CIP, including ranges.
- (6) Provide hearing program training for installation-directed courses, to include Field Sanitation Team (FST) Certification Courses.
- (7) Conduct noise surveys in field training environments (TOC, rest and common areas), training Soldiers to understand the non-auditory effects of nuisance noise, continuous exposures, and to utilize effective noise abatement strategies.
- (8) Requisition and maintain a supply of preformed earplugs and other types of hearing protection as needed.
- (9) Report program participation and quality assurance to Chief, Preventive Medicine on a quarterly basis.
- (10) Provide consultation and assistance to 101st Airborne Division (Air Assault) Division Surgeon, 5th SFG Surgeon, and 160th SOAR Surgeon, as well as all commanders, civilian activity directors, supervisors, and personnel on matters concerning hearing conservation.
- (11) Provide training, guidance, and technical support for unit-appointed Hearing Conservation Officers/Non-commissioned Officers (HCOs) in their appointed responsibilities (outlined in section n) for managing their unit hearing conservation program.
- (12) Provide training for unit medical assets or support personnel in obtaining national certification as hearing conservation technicians. Training requirements must meet standards of the Council for Accreditation in Occupational Hearing Conservation (CAOHC). These individuals will serve as the unit's subject matter expert on hearing conservation and support the unit with annual hearing readiness and operational requirements.
- (13) Provide courses for battalion and company level HCOs on a monthly basis, instructing Soldiers in the requirements and procedures for maintaining/monitoring unit hearing readiness, proper use of hearing protection for training and deployments, nuisance noise abatement strategies, and methods for prevention of acoustic trauma while maintaining critical communication ability. Additionally, this course will cover all aspects of the hearing conservation portion of the CIP checklist. Available course dates and locations are to be posted through the Division G3 office. The availability of this training is subject to staffing of the Hearing Conservation clinic.
- (14) Upon request, embeds with installation units during field and range exercises to determine practical solutions for difficult hearing protection and communication requirements, using various equipment combinations and strategies.
- (15) Coordinate with Civilian Personnel Advisory Center (CPAC), to review claims for occupational hearing loss. Provides consultation and submits written comments through the CPAC to the Department of Labor.

g. The Chief, Soldier Health Services will ensure that the Aviation Health Clinic (AHC) and LHC:

- (1) Provide earplug fitting services, and baseline hearing testing, for all in-processing personnel and deploying soldiers.
- (2) Refer all hearing and earplug fitting problems to the Fort Campbell HCPM.

- (3) Provide adequate staffing and facilities to perform hearing conservation testing and evaluation services to sustain a viable and effective AHP.
- h. Flight Surgeons will--
 - (1) Ensure initial baseline and annual audiometric evaluations are performed for all personnel on flight status.
 - (2) Refer all hearing related problems, other than ear wax to the Audiology/Hearing Conservation Clinic at LHC for evaluation and services.
 - (3) Monitor the fitting and use of the HGU-56P aviator's helmet and inspect the helmet condition per AR 95-1.
- i. The Installation Safety Office will--
 - (1) Inspect worksites to identify potential occupational noise hazards and refer such hazards to the appropriate noise hazard monitor for evaluation.
 - (2) Monitor the use of hearing protection devices to ensure compliance with established regulations.
 - (3) Include noise abatement projects in the installation hazard abatement plan as per objective 8, page 22, FTCKY Safety and Occupational Health Strategic Plan.
 - (4) Coordinate for safety issues related to hearing conservation.
 - (5) Record and monitor incidences of OSHA Reportable Hearing Loss as occupational illness (repetitive trauma) or as a one time acoustic trauma on the OSHA 300 log of injury and illness, except OSHA reportable hearing lost directly related to combat.
 - (6) Investigate hearing loss claims for scheduled award to determine if the claimant's work place contributed to the hearing loss and may endanger others, and ensure supervisors take appropriate action to eliminate further risk of noise-induced hearing loss.
- j. The Civilian Personnel Advisory Center will--
 - (1) Ensure that occupational health is included on in-processing and out-processing checklists for new, transferring, and terminating personnel.
 - (2) Annotate position descriptions with requirement to wear personal protective equipment (hearing protection) when identified by the manager or supervisor of the position.
 - (3) Inform Installation Safety Office of all workers' compensation claims for hearing loss.
 - (4) Coordinate with employee's supervisor when notified by Chief, Occupational Medicine of a hearing loss which could result in the employee being found to be medically unfit for current position.
 - (5) When consulted by supervisor, provide advice regarding options for disciplining employees who fail to comply with requirement to wear PPE.
- k. Directorate of Public Works (DPW) will--
 - (1) Erect and maintain noise hazard caution/danger signs.
 - (2) Implement, whenever feasible (per AR 40-5), acoustical engineering control measures when exposures to steady-state noise exceed the 85 dBA TWA.
 - (3) In new construction, apply noise criterion (NC) curve or room criterion (RC) specifications for various functional areas as outlined in United Facilities Criteria 3-450-01 Design: Noise and Vibration Control, 15 May 2003 and United Facilities Criteria 4-510-01 Design: Medical Military Facilities, 15 October 2003. If it is not defined in the Unified Facilities Criteria, the American Society of Air Conditioning and Refrigeration Engineers (ASHRAE) has published NC specifications in 1987 that also provide performance criteria for building design.
- l. Brigade Environmental Science Officers (ESO) will --
 - (1) Perform surveys of all known and suspected equipment, noise-hazardous and ototoxic exposure areas within the brigade area. Resurvey within 30 days of any reported changes in equipment.
 - (2) Submit the DD 2214 noise survey and the unit chemical inventory to Industrial Hygiene within 10 days of completion of the survey. Identify the building number, battalion, unit identification code and MOS's located in the noise hazardous area.
 - (3) In conjunction with the brigade training schedule, coordinate and schedule annual, pre and post deployment hearing screenings for all Soldiers and noise-exposed personnel within the Brigade (see Section n, paragraph 4). Contact the Hearing Conservation section personnel located at LaPointe Health Clinic to schedule audiometric testing booth time.
 - (4) Ensure the Brigade has a sufficient number of appropriately trained individuals within the unit who are certified by CAOHC as hearing conservation technicians to assist with unit hearing screenings (see Section f, paragraph 12). Contact the Installation HCPM for the schedule of training classes.
 - (5) Submit a quarterly Hearing Readiness report to the HCPM.
 - (6) Whenever possible, provide support for identifying generator and other noise source placement to better protect areas of critical communication, dense and/or long duration occupancy.

(7) Attend training briefings conducted by Industrial Hygiene personnel that demonstrate abatement techniques and personnel protection based on risk assessment.

m. Unit commanders and supervisors will--

(1) Appoint on orders an individual (officer, NCO, or civilian staff) to act as the unit Hearing Conservation Officer (HCO) as his/her primary appointed duty, to manage the unit hearing conservation program with responsibilities outlined in Section n. Ensures HCO completes installation-required training for hearing conservation activities.

(2) Endorse the 101st Airborne Division (Air Assault) Commanding General's emphasis policy letter on hearing conservation and stress the importance of preventive measures with a unit-level hearing conservation emphasis letter and a unit SOP detailing the hearing conservation program.

(3) Coordinate with the appropriate noise hazard monitor to properly identify noise-hazardous personnel areas and positions for annotation on job descriptions when appropriate. Post and maintain noise hazard danger and caution signs and decals for all identified areas and equipment. Select the lowest noise levels feasible when purchasing new equipment

(4) Enforce the mandatory use of hearing protectors for all personnel when around noise hazard areas and take disciplinary action as appropriate for non-compliance. Require all Soldiers and noise-exposed personnel to maintain earplugs and the earplug carrying case as an item of individual equipment. Soldiers will wear the earplugs and earplug carrying case as part of the army combat uniform (ACU), either on the Soldier's front right belt loop of the ACU trousers, on the Soldier's top right row of loops on the flack vest or in the left arm pocket of the nomex flight suit.

(5) Consult with Installation HCPM for noise-hazardous missions requiring preservation of critical communication ability using communication enhancement/protection systems. Ensure Soldiers are adequately trained with nonlinear systems as required. Ensure all soldiers deploying with an H2 or H3 profile are offered an MOS appropriate alternative for Enhanced Hearing Protection.

(6) Ensure medical threat briefings provided prior to unit deployments include noise hazard descriptions and preventive measures (i.e. hearing protection and noise abatement strategies) for troops.

n. Unit Hearing Conservation Officers/NCOs (HCOs) will—

(1) Contact the Installation HCPM for guidance and technical support for implementing a comprehensive hearing conservation program for the unit.

(2) Consult with the Division G3 office for available course dates and locations for instruction on procedures for maintaining/monitoring unit hearing readiness, proper use of HPD, nuisance noise abatement strategies, and methods for prevention of acoustic trauma while maintaining critical communication ability. Additionally, the course covers all aspects of the hearing conservation portion of the CIP check list. The availability of this training is subject to staffing of the Hearing Conservation clinic.

(3) Maintain a unit Hearing Conservation binder, which includes copies of all pertinent regulations, unit education records and unit hearing readiness tracking records.

(4) Coordinate and schedule annual, pre- and post-deployment hearing examinations for all Soldiers and noise-exposed personnel through the Brigade ESO or other appointed representative.

(5) Use the Medical Protection System (MEDPROS) for monitoring the Hearing Readiness Classification (HRC) of unit personnel. Ensure Class 4 Soldiers complete required DOEHRs-HC hearing tests and Class 3 Soldiers complete diagnostic evaluations with an installation audiologist in a timely manner. On a quarterly basis, report Hearing Readiness status to the Brigade ESO or other appointed representative. Achieve an 85% unit compliance rate for annual testing.

(6) Utilize appropriately trained individuals within the unit who are certified by CAOHC as hearing conservation technicians to assist with unit hearing screenings. Contact the Brigade ESO for technician certification course schedules.

(7) Ensure all Soldiers and noise-exposed personnel receive operational hearing education at least annually and maintain training roster as documentation. Consult with the Installation HCPM for support as needed.

(8) Provide input to deployment medical threat briefings, and/or to preventive medicine assets, in regard to noise hazards, hearing protection, communication enhancement, and noise abatement strategies relevant to the projected threat of the intended theater of operations.

(9) Requisition and maintain an adequate supply of approved hearing protectors, including helmets, noise muffs, or preformed (triple-flange, quad-flange or combat arms types) earplugs in preparation for training exercises and deployments. Earplugs requisition information is provided in DA Pam 40-501, table 6-1, or in Appendix E.

(10) Maintain an adequate supply of approved hand-formed (orange and green) earplugs for visitors or personnel not possessing preformed earplugs.

(11) Ensure that approved earplugs are selected and fit by a hearing conservation technician or appropriately trained personnel. Ensure these earplugs are examined at least annually to ensure proper fit and condition. Coordinate with the Hearing Conservation clinic for earplug fitting training.

(12) Ensure aviation or CVC type helmets and noise muffs are examined for proper fit and condition at least semi-annually.

(13) Ensure an approved earplug carrying case is provided, free of charge, to personnel exposed to noise hazards. Ensure appropriate wear of earplugs and earplug case by unit Soldiers. (See Appendix E for order information)

(14) Prepare a unit SOP detailing the AHP implementations at unit level. Review unit range SOP for inclusion of hearing conservation procedures. Contact the Installation HCPM for assistance with preparing a unit SOP as needed.

o. Noise-exposed personnel will--

(1) Maintain a pair of preformed earplugs in serviceable condition and an earplug carrying case as an item of personal protective equipment, and keeps earplugs and carrying case in their possession as part of their uniform or load bearing vest as directed.

(2) Correctly wears approved and properly fitted hearing protectors when exposed to hazardous noise (i.e., weapons firing, tactical vehicles, motorcycles, motorboats, power tools, MOUT, etc.)

(3) Report for all scheduled medical examinations and health education briefings on hearing conservation.

(4) Immediately report suspected hearing problems following weapons firing or exposure to blasts/explosions in the combat or training environment to their supervisor for appropriate medical attention. Immediately report problems (i.e., loss/damage or inadequate fit) of hearing protectors to supervisors.

(5) Wear noise dosimeters to evaluate noise exposure when requested.

7. Noise hazard identification

a. As a part of the Industrial Hygiene Program, the IHPM-

(1) Conducts noise surveys with support of the Brigade Noise Hazard Monitor of all suspected noise-hazardous areas, vehicles, and equipment at least once and within 30 days of any change in operations.

(2) Determines the TWA for all Department of Defense (DoD) civilian employees routinely working in hazardous noise areas and military personnel working in hazardous noise industrial-type operations at least once and within 30 days of any change in operations affecting noise levels.

(3) Supervises and ensures industrial hygiene staff and Brigade Noise Hazard Monitors complete visits to each potentially noise-hazardous area at least once a year to fulfill requirements of AR 385-10.

(4) Ensures applicable 85 dBA and 140 dBP noise contours are established and advises the unit Commander or supervisor where to locate hazard signs.

b. Industrial hygiene technicians or personnel trained in the use of noise measurement equipment-

(1) Will perform noise surveys as required. Guidance for performing noise surveys is provided in USACHPPM TG 181. Details for survey equipment and calibration guidelines are outlined in DA Pam 40-501, para 4-2.

(2) Noise surveys will be completed and documented using the DOEHS-HC DD Form 2214 and/or DD form 2214C to identify hazardous noise survey results. Reports will be distributed and maintained IAW DA Pam 40-501, para 4-5.

c. Military and DOD civilian personnel may request a noise survey any time potentially noise-hazardous equipment is purchased or following any change in operations. In addition, previous noise survey records for specific locations can be requested. Record and survey requests can be directed to the IHPM.

d. The unit Commander or supervisor ensures that danger/caution signs and decals are posted at entrances to, on the periphery of, and on noise-hazardous equipment and vehicles in accordance with the Safety Color Code Markings, Signs and Tags Information Guide. In addition, 29 CFR 1910.95 must be posted in all industrial, noise-hazardous areas.

(1) Signs and decals may be obtained from the Department of Public Works.

(2) Sign requests must be submitted in memorandum format. Memorandums must include a description of the sign, specify the number of signs requested, the intended use of the sign(s), the building number for the sign, a point of contact with phone numbers for request, and be signed by either a unit First Sergeant or Company Commander.

8. Engineering controls

a. The most desirable hearing conservation measure is reducing noise levels at their source and eliminating harmful health effects. Implementation is generally feasible, if technologically and operationally practicable and

cost effective. Procuring new equipment, vehicles or facilities offers the ideal opportunity to implement noise controls. The objective is to review all acoustic specification before purchase to ensure, if possible, a steady-state level less than 85 dBA at all personnel work locations during normal operations.

b. Control measures for existing equipment and facilities to reduce steady-state noise levels below 85 dBA and impulse noise levels below 140 dBP, should be employed to the maximum extent possible. In some instances, the implementation of engineering controls requires funding which is rank ordered on the installation hazard abatement plan per AR 385-10 and TB MED 503. In other instances, simple maintenance of the equipment, vehicles, or facilities will eliminate or control the hazard. Details for effective maintenance noise-control measures can be found in DA Pam 40-501, para 5-2.

c. An industrial hygienist from the Preventive Medicine Service can be consulted for engineering control recommendations and follow-up measures.

9. Hearing Protection Devices (HPDs)

a. All personnel working within or visiting potentially noise-hazardous areas must have hearing protectors with them at all times. Military personnel will wear the earplug case containing preformed or hand-formed earplugs as a standard part of the uniform, either on the Soldier's front right belt loop of the ACU trousers, the Soldier's top right equipment loop of the flak vest, or the left arm pocket of the nomex flight suit.

b. Hearing protection devices (HPDs) consist of earplugs, noise muffs, ear canal caps, noise-attenuating helmets, or a combination of these. A list of approved hearing protection devices for government purchase can be found in Appendix E, which includes an example of a typical HPD purchase for a military unit. Personnel may select the type of protector desired, unless the selection is medically contraindicated or inappropriate for a particular noise-hazardous environment. In-depth descriptions and maintenance recommendations of approved HPDs can be found in DA Pam 40-501, paras 6-3 and 6-5.

c. HPDs are issued at no charge to all military personnel and to all DoD civilians working in potentially noise-hazardous areas. An earplug carrying case must also be provided at no charge with each set of preformed earplugs. This case can also be used for hand-formed earplugs. HPDs are considered required personal protective equipment for military deployments.

d. Fittings & Annual Integrity Checks. Organic unit assets that are CAOHC certified hearing technicians are qualified to complete fittings and integrity checks. Units without certified technicians may request support from the HCPM or the Hearing Conservation Clinic at 956-0305.

e. Requisition. Division unit HCOs must requisition HPDs through their Brigade Medical Supply Officers (BMSOs) using appropriate national stock numbers (Appendix E). Non-Division unit HCOs must requisition HPDs through the Department of Logistics at Blanchfield ACH by creating an account for Class VIII supply orders.

f. Requirements. Civilians and military personnel must wear appropriate hearing protection when working with or around equipment, tactical vehicles or weapons that produce hazardous levels of noise. Definitions of hazardous noise are listed below. Examples of steady-state and impulse noise levels produced by common military equipment are included in Appendix C.

(1) *Steady-state noise levels of ≥ 85 dBA* (regardless of duration) – requires single hearing protection.

(2) *Steady-state noise levels of ≥ 103 dBA* (regardless of duration) – requires double protection (i.e.; earplugs and helmets or earplugs and noise muffs).

(3) *Steady-state noise exposure > 108 dBA* – exposure is not permitted.

(4) *Impulse noise levels of ≥ 140 dBP* – requires single hearing protection.

(5) *Impulse noise levels > 165 dBP, but less than or equal to curve Z* per MIL-STD 1474D, requirement four, figure 4-1, personnel must wear earplugs in combination with noise muffs or a noise-attenuating helmet.

(6) *Impulse noise levels greater than curve Z*, The Surgeon General must approve exposure.

(7) *Combat scenarios and HPDs.* In combat, Soldiers should wear hearing protectors, especially when firing weapons or riding in tactical vehicles or aircraft. Hearing protectors improve readiness and prevent permanent or temporary threshold shifts which impair the ability to communicate and to detect and localize quiet or low level combat sounds.

(8) *Combat scenarios and communication requirements.* In combat, Soldiers should be fit with nonlinear HPDs (i.e.; combat arms earplugs) or communication enhancement systems when impairment to hearing is detrimental to mission requirements (i.e., dismounted infantry operations).

10. Monitoring audiometry and hearing readiness

a. Monitoring audiometry detects changes in an individual's hearing sensitivity. This information identifies individuals who are highly susceptible to noise-induced hearing loss, allows for early identification of and

intervention for hearing loss, and evaluates the effectiveness of the hearing conservation program. Hearing Readiness (HR) specifically focuses on ensuring Soldiers have the required physical capabilities, personal protective equipment (i.e., HPDs) and medical equipment that are needed to deploy. The main component of HR is monitoring audiometry. All hearing evaluations are to be completed on the DOEHRS-HC audiometer with results recorded on DD forms 2215 (Reference Audiogram) and 2216 (Hearing Conservation Data).

b. DoD Civilians. Reference audiograms for new civilian personnel with a potential for hazardous noise exposure must be performed as soon as possible, but not later than 30 days after initial exposure. Civilians will receive hearing tests administered by the Occupational Health clinic of Blanchfield ACH upon referral to the HCP. Hearing tests can be scheduled by contacting (270) 956-0202.

c. ALL noise-exposed and/or ototoxicity exposed civilian personnel must receive reference, 90-day, annual, and termination audiograms. Follow-up hearing tests, 1 and 2, must also be provided, if required. Deaf civilians working in noise-hazardous areas must have reference and termination audiograms.

d. Termination audiograms must be conducted as part of out-processing or when a worker is going to stop working in a designated noise-hazardous area.

e. Soldiers. ALL Soldiers, regardless of potential noise exposure, must receive reference, pre-/post-deployment, and termination audiograms. Audiograms are required every 12 months, or within 6 months of (re)deployments.

f. Deployable Status. In order to be deployable, Soldiers must maintain a Hearing Readiness Classification (HRC) of Class 1 or Class 2. Appendix F provides the four basic HRC categories with definitions. To meet hearing readiness requirements, HCOs may schedule unit Soldiers for their DOEHRS-certified hearing tests by contacting their Battalion ESO or the LHC Hearing Conservation section at 956-0305.

g. Recordkeeping. Soldiers and DoD civilians will be provided with a copy of all hearing test results for their medical record. All DOEHRS-HC data will be forwarded to the DOEHRS-Data Repository, maintained at Aberdeen Proving Grounds, on a daily basis.

h. MEDPROS. The Medical Protection System (MEDPROS) HR module is used to track and monitor individual and unit level HR. DD2215 and 2216 audiograms are stored in the DOEHRS-DR and are used to calculate the HR status for MEDPROS. The DOEHRS-DR feeds the MEDPROS system on a weekly basis. HCOs can obtain unit Hearing Readiness (HR) reports through the MEDPROS Hearing Readiness Reporting Options function. Soldiers and HCOs can obtain copies of test results through personal Army Knowledge Online (AKO) accounts and through the MEDPROS Web Data Entry portal. In summary:

(1) Soldiers with an HRC of Class 1 or 2 are deployable.

(2) Soldiers with an HRC of Class 3A-C are non-deployable and require a referral to an audiologist for the completion of a diagnostic evaluation, profile and/or MMRB (required for H3 profiles).

(3) Soldiers with an HRC of Class 3D-E are non-deployable and require either a hearing aid fitting and/or a 6 month supply of batteries for issued hearing aid(s).

(4) Soldiers with an HRC of Class 4A require an annual DD2215/16 hearing evaluation. A Class 4B indicates a significant threshold shift (STS) was detected on the annual hearing evaluation and requires a follow-up with the hearing conservation section technicians within 30 days.

i. The Installation HCPM will ensure installation test equipment, test methods, clinical services, diagnosis, medical and MEDPROS coding, referrals and notification processes (including OSHA reportable hearing losses) are in compliance with DA Pam 40-501, para 7-3 through 7-7 and FM 4-02.17 Appendix C, para C-9 through C-10.

11. Health education

The HCO or designee must ensure hearing conservation health education at least annually to ALL military and noise-exposed civilian personnel. Instruction requirements and educational materials are detailed in DA Pam 40-501, paras 8-1 and 8-2. Unit HCOs are required to track annual unit requirements, coordinate instruction blocks with HCPM by contacting 956-0305, and maintain documentation for completion of course (i.e., sign-in rosters). HCOs may also obtain educational resources for briefings from the HCPM.

12. Enforcement

a. Command Emphasis. The unit commander or supervisor of personnel working in noise-hazardous areas must endorse the installation commander's command emphasis letter explaining the importance of the HCP, the Fort Campbell HCP regulation, and the wearing of the earplug carrying case as part of the ACU, flak vest and/or the nomex flight suit.

b. Compliance Measures.

(1) Military and civilian supervisors of noise-hazardous areas must enforce the mandatory use of hearing protectors and take disciplinary action (i.e.; counseling statements) as appropriate for non-compliance.

Commanders must enable unit safety officers and HCOs to bring units into compliance with the Air Assault and Fort Campbell Hearing Program.

(2) The HCPM will conduct unannounced inspections of noise-hazardous areas (including motor-pools, ranges, etc.) to ensure compliance with both HCP and HPD requirement and report inspection results through command channels as appropriate.

(3) The IHPM will inspect noise-hazardous areas to ensure compliance with HCP and HPD requirements during both announced and unannounced surveys.

13. Program evaluation

The HCP will be evaluated using both external and internal reports IAW DA Pam 40-501, paras 10-2 and 10-3. Program effectiveness, quality assurance, and compliance indicators will be forwarded to the Installation Medical Authority on a regular basis as required.

14. Operational Hearing Services (OHS)

a. The primary objective of operational hearing services is to enhance Soldier survivability. Hearing is a critical sense that directly affects mission success. Activities in garrison are geared towards preserving the ability to hear in a deployed, combat environment to enable the Soldier to detect the enemy and communicate effectively in noise. Garrison OHS includes communication enhancement/protection devices, hearing loss prevention tactics and noise surveillance/abatement strategies.

b. Communication Enhancement/Protection Devices (CEPDs). CEPDs are systems with active filters that protect hearing in the combat environment while enhancing the ability to hear on radios and among dismounted team members during missions.

(1) Contact the HCPM for information regarding CEPD use and procurement.

(2) Commanders must ensure their units are provided the opportunity to train with CEPDs and understand the use and importance of these devices in maintaining effective communication and situational awareness. Upon procurement, it is recommended that CEPDs are distributed on hand receipts (DA Form 2062) for accountability due to expense of individual systems.

c. Noise Surveillance and Abatement. For guidance regarding suspected *hazardous* noise levels, refer to section 7 of this document for standard procedures. For *nuisance* noise abatement, contact the HCPM for training and assistance. Field environments, including TOCs, rest areas and motor pools, will be assessed with strategies for effective abatement outlined in verbal and written reports. HCOs will be trained in abatement during required operational and hearing readiness training courses and are responsible for implementing recommendations. *Nuisance noise* is not normally recognized, addressed or limited, but its *effects (stress, fatigue) can be devastating on the Soldier, the unit, and the mission*.

(1) Ideal Noise Levels. Ideal noise levels for the field environment that allows for maximum efficiency:

(a) TOCs and common areas – noise levels not exceeding 55 dBA SPL, preserve the ability to communicate comfortably at distances up to 15 feet.

(b) Sleep Areas – *steady-state* noise levels of ≤ 40 dBA allow for sufficient sleep cycles. In noisy environments, however, ‘maskers’ or broadband noise (such as a fan) may be required to eliminate the negative effects of relatively low-level intrusive noise (i.e., intermittent field radio communications). The impact of *intrusive noise* varies (i.e.; intermittent landings of rotary and fixed-wing aircraft or tactical vehicles entering/leaving the compound). The sound level will depend on the engine type and distance from the source. For example, a UH-60 helicopter will produce up to 90 dBA of intrusive noise inside a sleeping tent located 150 yards from the landing pad. This level of intrusive noise can be expected to awaken approximately 40% of tent occupants. The use of disposable foam earplugs is the best remedy for situations involving regular intrusive noise.

(2) Basic Abatement Strategies. Basic strategies for nuisance noise abatement in the field are as follows:

(a) Move generators away from tents and use air conditioner extension hoses whenever feasible. The Inverse square law predicts that doubling the distance from a sound source decreases intensity levels by 6 dB.

(b) Place generators behind natural berms or enclose three sides of generators with sand bags, leaving room for proper ventilation. Point vented side of generator (normally the loudest side of equipment) *away* from tents.

(c) Design the TOC layout for maximum efficiency (i.e.; provide briefing areas away from radios). Determine which strategies work in the field environment *before* deployment.

(d) Provide foam earplugs for sleep tents to reduce effects of intrusive noise and ensure maximum ability to achieve REM sleep for Soldiers.

15. Garrison nuisance noise

Nuisance noise produced by vehicles (i.e., excessive engine noise or stereo volume levels) and in post housing must be kept to a minimum to avoid interference with the perception of warning sounds or emergency vehicle signals. Nuisance noise is a citable offense in accordance with local ordinances. Command policy states that a radio detectable at distances of ≥ 20 feet from the vehicle is excessive with violators subject to appropriate disciplinary action.

16. Hearing Conservation Clinic

- a. Hearing Conservation is an individual and organizational responsibility. All commanders are encouraged to utilize the resources of the HCPM and the Hearing Conservation Clinic of LaPointe Health Clinic for the development and maintenance of their unit hearing conservation program.
- b. Additional operational hearing conservation services, including preparatory assistance for the Hearing Conservation portion of the CIP, range and worksite consultations, custom hearing protection services, and hearing conservation certification workshops are available to installation units.
- c. Contact the Hearing Conservation Clinic at (270) 956-0305 for more information and/or assistance.

FOR THE COMMANDER:



THOMAS D. VAIL
Colonel, GS
Chief of Staff

DISTRIBUTION:
Intranet

Appendix A References

- AR 40-5, Preventive Medicine - Rapid Action Revision (RAR), May 2007.
- AR 40-66, Medical Record Administration and Health Care Documentation, 21 June 2006.
- AR 40-501, Standards of Medical Fitness, 27 June 2006.
- AR 420-70, Building and Structures, 10 October 1997.
- AR 385-10, Army Safety Program, 29 February 2000.
- CHPPM Form 326, Assessing the Effects of Sound on Sleep, 01 November 2005.
- DA PAM 40-501, Hearing Conservation Program, 10 December 1998.
- DD Form 2214, Noise Survey, 1 January 2000.
- DD Form 2214C, Noise Survey Continuation Sheet, 1 January 2000.
- DD Form 2215, Reference Audiogram, 1 January 2000.
- DD Form 2216, Hearing Conservation Data, 1 May 1996.
- FM 4-02.17, Preventive Medicine Services, January 2006.
- MIL-STD-1472F, DoD Design Criteria Standard Human Engineering, 31 March 1998.
- Safety Color Code Markings, Signs and Tags Information Guide. (Copies are available from the U.S. Army Safety Center, ATTN: CSSC-SM, Fort Rucker, AL 36362-2563).
- TB MED 503, The Army Industrial Hygiene Program.
- 29 CFR 1910.95, Occupational Noise Exposure (Copies are available from the Superintendent of Documents, U.S. Government Printing Office, WASH, DC 20402).

Appendix B Terms and Abbreviations

Terms:

Audiogram – A written representation of human hearing. Audiograms may be written in graph or serial format.

- **Serial** – Uses numbers in a table to depict thresholds. The forms used to record hearing thresholds for hearing conservation are serial audiograms.
- **DD2215** Reference audiogram, also called a baseline audiogram
- **DD2216** Periodic, Annual, Pre-/Post-deployment, 90-Day, Follow-up, Termination or Other audiograms
- **Graph** - Uses a graph to depict threshold.

Decibel - unit of measurement for sound, abbreviated dB.

Frequency - is perceived by the listener as pitch. The unit of measure for frequency is Hertz (Hz). Humans can detect pitches ranging from 10-10,000 Hz.

Hazardous noise area- is any working area in which workers are likely to be exposed to sound (noise) levels greater than 85 dBA, steady-state noise, or greater than 140 dBP, impulse noise.

Intensity- is perceived by the listener as loudness. Intensity is measured in decibels (dB). Decibels are normally referenced to a scale, such as dBA or dBHTL. The **A** scale is used for measuring noise, the **HTL** scale is used for measuring individual hearing ability. The term **SIL** indicates the speech interference level of background noise.

Noise Dose- is the ratio, expressed in percent, of the severity of a noise environment to the severity of exposure to 85 dBA for an 8-hour workday. A noise dose of 100% equals 85 dBA.

Occupational Safety and Health Association Reportable Hearing Loss (OSARRHL) – Hearing loss is OSHA reportable when BOTH of the following occur:

- An STS occurs (an average 10 dB or greater change for thresholds averaged at 2, 3, and 4 KHz in either ear from the current baseline audiogram)
- Hearing thresholds for the current audiogram show an average of 25 dB or greater at 2, 3, and 4 KHz from audiometric zero for the shifted ear.

Risk Assessment Code (RAC)- is an expression of risk that combines the elements of health hazard severity and mishap probability. RAC's are expressed in Arabic numbers. RAC's rank order the hazards with lower number demanding more immediate attention.

Threshold- Represents the softest sound level a listener can detect about 50% of the time the sound is presented. Human hearing is measured with an audiometer. The unit of measure for human hearing is dB (HTL) (Hearing Threshold Level). Audiometers usually measure hearing from 0 to 110 dial. 0 dB does not mean the absence of sound it represents a reference of the softest sound level the human hearing mechanism can detect.

Time-weighted Average (TWA)- is the measure of a worker's average noise exposure over the duration of the workday, expressed as DOSE%, or dBA; a measure of employee's workday noise environment.

Ranges of Hearing

- -10 - 25 dB HTL Normal hearing
- 26 - 40 dB HTL Mild hearing loss
- 41 - 65 dB HTL Moderate hearing loss
- 66 - 90 dB HTL Severe hearing loss
- 90 + dB HTL Profound hearing loss

Abbreviations:

AHP – Army Hearing Program (as redefined in the RAR of AR 40-5)

Blanchfield ACH – Blanchfield Army Community Hospital

BMSOs – Brigade Medical Supply Officers

DOEHRS-HC – Defense Occupational Environmental Health and Readiness System-Hearing Conservation

DOEHRS-DR – Defense Occupational Environmental Health and Readiness System-Data Repository

CAOHC – Council for the Accreditation in Occupational Hearing Conservation. Board Certification (or military course equivalent) required for hearing technicians

CEPD – Communication Enhancement/Protection Device

HCOs – Hearing Conservation Officers/Non-Commissioned Officers, appointed by commanders at the unit level (i.e., BDE, BN, CO)

HCP – Hearing Conservation Program

HCPM – Hearing Conservation Program Manager

HPDs – Hearing Protection Devices, traditional earplugs, ear muffs, canal caps, etc.

HR – Hearing Readiness

HRC – Hearing Readiness Classification

IHPM – Industrial Hygiene Program Manager

REM Sleep – rapid eye movement sleep, a state of sleep that recurs cyclically several times during a normal period of sleep and that is characterized especially by increased neuronal activity of the forebrain and midbrain, depressed muscle tone, dreaming, and rapid eye movements

SEG – similar exposure group

SOP – Standard Operating Procedure

STS – Significant Threshold Shift - a change in an individual's hearing levels. Can be positive (hearing has worsened) or negative (hearing has improved).

TOC – Tactical Operations Center

TSG – The Surgeon General


**Appendix C
Military Noise Sources**

STEADY-STATE NOISE

Photo	Model	Name, Condition	Location	Speed km/hr (mph)or	Sound Level dB(A)
	M966, also: M996 M997 M998 M1037 and other non-heavy	High mobility multi- wheeled vehicle (HMMWV), at 2/3 payload	Crew positions	0(idle)	78
				48(30)	84
				88(55)	94
	M996 M997	HMMWV mini and maxi ambulance, at 2/3 payload	Patient areas	up to 88 (55)	less than 85
	M1097 M1097A2 M1113 M1114	HMMWV heavy variants, at 2/3 payload	Crew positions	up to 50 (31)	less than 85
				64(40)	88
				80(50)	92
				96(60)	98
	M1097	HMMWV heavy variant, at full payload	Crew positions	up to 40 (25)	less than 85
				96(60)	100
	M1008 M1009 M1010 M1028	Commercial utility cargo vehicle (CUCV)	In cab	below 88 (55)	less than 85
				88(55)	85 to 91

Photo	Model	Name, Condition	Location	Speed km/hr (mph)or	Sound Level dB(A)
	M1010	Ambulance	Patient Areas	all speeds	below 85
	M1080 chassis, includes M1078 M1079 M1081	Light medium tactical vehicles (LMTV 2 1/2 ton trucks), 2/3 payload	In cab	0 idle 72(45) 75(46) 88(55)	80 84 85 89
	M1092 and M1096 chassis, except M1089 wrecker	Medium tactical vehicles (MTV 5 ton trucks), 2/3 payload	In cab	0 idle 72(45) 75(46) 88(55)	80 84 85 89
	M1089	5 ton wrecker, towing, 2/3 payload	In cab	up to 48 (30) 56(35)	less than 85 87
	M984E1	Heavy Expanded Mobility Tactical Truck (HEMTT)	In cab	64(40) and below 72(45)	below 85 93.1
	M44A3 series includes M35A3 M35A3C M36A3	2 1/2-ton truck, extended life program (ESP), 2/3 payload	In cab	Idle 16(10) 32(20) 80(50)	72-81 85 87 97
	M1070	Heavy Equipment Transporter (HET), loaded	In cab	All speeds	Below 85
	M1074 M1075	Palletized load system, 16.5 tons		In cab, windows closed Windows open	All speeds 85 or below 88(55) 87 below 88(55) below 85

Photo	Model	Name, Condition	Location	Speed km/hr (mph)or	Sound Level dB(A)
	M113A3 family including M106A2 M1064A3 M1059A3 M58A3 M730A2 M901A3 M981A3	Armored Personnel Carrier A3 version. M113, M113A1, M113A2, OSV(BMP2) have similar noise levels		Idle 16(10) 32(20) 48(30) 63(40)	85-92 106 109 114 118
	M1A2, M1, M1A1 M1 chassis similar	Abrams tank Grizzly breacher, Wolverine Heavy assault bridge (HAB)	In vehicle	Idle Tac idl 16(10) 48(30) 63(40)	93 103 108 114 117
	M2A2 M2, M3, M2A1, M3A1, M3A2 similar	Bradley Fighting Vehicle	In vehicle	Idle 16(10) 32(20) 61(38)	74-95 110 115 115
	M88A2	Hercules recovery vehicle	In vehicle	various	89 to 106
	M270	Multiple Launch Rocket System (MLRS) vehicle	In vehicle	Idle Moving, various speeds	83-98 99 to 111
	M109A3E2 other versions similar	Paladin, 155 mm self propelled howitzer	In vehicle	Idle Moving, various speeds	83-98 99 to 111
	MEP-802A	5 kW Tactical Quiet Generator(TQG)	Operator panel	Rated load	80

Photo	Model	Name, Condition	Location	Speed km/hr (mph)or	Sound Level dB(A)
	MEP-803A	10 kW TQG	Op panel	Rated load	81
	MEP-804A	15 kW TQG	Op panel	Rated load	84
	MEP-805A	30 kW TQG	Op panel	Rated load	84
	MEP-806A	60 kW TQG	Op panel	Rated load	87
	CH-47D	Chinook helicopter	Cockpit		102.5
	UH-60A	Blackhawk helicopter	Pilot copilot		106 106
	YAH-64	Apache helicopter	Pilot copilot		104 101.3
	OH-58D	Kiowa helicopter	Right seat Left seat		101.6 100.3
	UH-1H	Huey helicopter	Pilot/copilot Max in rear		101.9 102.9

Section C-2

IMPULSE NOISE

Photo	Model	Name	Location	Sound Level dB(P)
	M16A2	5.56mm rifle	Shooter	157
	M9	9mm pistol	Shooter	157
	M249	5.56mm Squad Automatic Weapon (SAW) fired from a HMMWV	Gunner	159.5
	M60	7.62mm machine gun fired from a HMMWV	Gunner	155
	M2	0.50 caliber machine gun fired from a HMMWV	Gunner	153
	MK 19 Mod 3	machine gun fired from a HMMWV	Gunner	145
	M26	Grenade	At 50 ft	164.3
	M3	MAAWS recoilless rifle	Gunner	190
	M72A3	Light Antitank Weapon (LAW)	Gunner	182
		JAVLIN	Gunner open Position	159.9
			Gunner enclosed position & Gunner fighting position	166.2
				172.3

Photo	Model	Name	Location	Sound Level dB(P)
	M119	105MM towed howitzer at charge 8	Gunner	183
	M198	155mm towed howitzer firing M203 propellant	Gunner	178
	M109A5/6	Paladin, 155mm self propelled howitzer firing M4A2 zone 7 charge	In fighting compartment, hatches open except driver's	166.1
	M110A2	8-inch self propelled howitzer firing M106 projectile with a M188A1 zone 9 propelling charge,	Gunner	176.9
	M224	60mm mortar, M888 round, charge 4, QE 800 mil	0.5 m from the muzzle, 0.9 m above ground, 105 degree azimuth	185
		TOW II Missile from HMMWV	Gunner	179.4
	M29A1	81 mm mortar, M374A3 round with charge 4	1 m from the muzzle, 0.9 m above ground, 135 degree azimuth	178.8

Section C-3

CHARACTERISTICS OF INDIVIDUAL EQUIPMENT NOISE

The following paragraphs summarize additional noise exposure considerations for common Army equipment:

a. *Trucks and High Mobility Multi-wheeled Vehicles (HMMWV)*. Noise levels increase with increasing speed and, for the HMMWV, with increasing load. The levels are below 85 dBA at low to medium speeds and can be over 100 dBA at top speed for some models. When driven mostly at low speeds with short periods at moderate or high speed trucks and HMMWVs are not hazardous. They can be hearing hazards to unprotected Soldiers if operated for long time periods at high speed.

b. *Bradley Fighting Vehicle (BFV) and derivatives*. The major noise source is the drive train, particularly the action of the track links as they round over the sprockets, idlers and wheels. For this reason, high noise levels (101 to 115 dBA) occur when the vehicle is in motion. The crew wears the combat vehicle crewman's (CVC) helmet which has integral hearing protectors. A CVC with active noise reduction (ANR) providing added noise protection is available on newer models. The passengers (infantry squad) must rely on their own hearing protectors such as earplugs. These are less effective than the CVC with ANR. For training, the exposure time in moving carriers is restricted depending on the hearing protectors worn and the speed of the vehicle. The severest restriction is on exposure of passengers wearing the less effective earplugs.

c. *M113 Armored Personnel Carrier and derivative vehicles*. Among the loudest of Army equipment. Noise sources and hearing protection are similar to the BFV. Levels are very high when moving.

d. *Abrams Tank and derivative vehicle (Wolverine and Grizzly)*.

(1) Steady noise levels range from 96 to 117 dBA when moving. The crew wears the CVC helmet which has integral hearing protectors.

(2) On the tank, impulse noise levels at exterior commander and loader positions are above or just below the limit of hearing protector effectiveness for training depending on caliber (105 or 120 mm), cartridge model, and tube elevation. The drivers hatch should be closed at all times when firing the main gun. Training with crew heads above the hatch plane is not permitted per the user manuals for certain defined conditions. These restrictions are not applicable to battle situations.

e. *Helicopters*. In flight, helicopter crews wear the helicopter crew helmets which have integral hearing protectors. Passengers must rely on their own hearing protectors such as earplugs or ones supplied by the air operations. Training restrictions on exposure time apply, as discussed for the BFV.

f. *Generators*. Diesel powered generators from the Tactical Quiet Generator (TQG) series are quiet at the operator panel and other close-in areas if the covers are in place. Older generators have been loud with levels above 100 dBA at the panel and above 85 dBA up to several meters away. High levels are generated by TQG if the covers are removed.

g. *Impulse noise from weapons*. All firearms produce impulse noise levels requiring hearing protection at crew positions for training. Some produce levels under certain conditions, which exceed the safe training limit for crews wearing hearing protectors.

(1) Small arms- rifles pistols, machine guns, and 40 mm grenades. Noise levels at gunner positions are low to moderate. The hazard can be serious because of the large number of rounds that can be fired by the individual shooter. Noise levels are higher in front and to the side of the muzzle than to the rear. For small arms levels at about 5 feet to the side can be higher than at the shooter position. Except very near the muzzle, all levels are within the mitigation capability of hearing protectors.

(2) Mortars. Noise levels range from low to very high because of the wide variation in charge increments and head locations. The requirement to load the cartridge through the muzzle places the head close to the muzzle, which is the source of the impulse. For the top charge on the large ground mount mortars, a safe noise level for training occurs only at 2 m from the muzzle, no higher than 0.9 m above ground. Some mortars include a funnel-shaped blast-attenuating device on the muzzle.

(3) Howitzers without fighting compartments. For the 155 mm towed and 8-inch self-propelled howitzers the levels are medium to high depending on the charge increment, but are below the training exposure limit for protected Soldiers.

(4) Howitzers with fighting compartments. For the 155 mm self-propelled howitzers the walls of the fighting compartment tend to attenuate the peak levels but the reverberation within the compartment aggravate the noise exposure. For some higher charges the front, top, and side hatches should be closed during training fire.

(5) Tanks. The levels above the turret hatches can be very high for some cartridges and at some tube elevations. For these, training fire with crew heads above the hatch plane is not recommended. Levels below the hatch plane, even with the hatch open, are lower.

(6) Rocket launcher vehicles. Impulse noise in the MLRS, Avenger, and FOG-M launchers are low to medium.

Appendix D

Examples of Hazardous Exposures

The following provides examples of typical exposures that meet the criteria for enrollment in a comprehensive Hearing Conservation Program:

1. Impulse & impact noise >140 decibels peak measurement (dBP):
 - a. All weapons firing (annual or periodic).
 - b. 9-mm through 50-Caliber. Ammunition
 - c. Grenades
 - d. Mortar fire
 - e. Artillery fire
 - f. Armament from all tracked and wheeled combat vehicles
 - g. Demolition with explosives
 - h. Most training rounds and simulators

2. TWA of >85 A-weighted decibels (dBA):
 - a. Operating, occupying or maintenance operations of tactical vehicles that require hearing protection (per TM/FM or operator's manual).
 - b. Operating, occupying or maintenance operations of aircraft that require hearing protection (per TM/FM or operator's manual).
 - c. Operating on or around heavy equipment or noisy machinery requiring hearing protection (per TM/FM or operator's manual).

3. Known or suspected ototoxins (ear poison):
 - a. Arsenic
 - b. Carbon disulfide
 - c. Carbon monoxide*
 - d. Cyanide
 - e. Lead and derivatives
 - f. Manganese
 - g. Mercury and derivatives
 - h. N-hexane
 - i. Stoddard solvent
 - j. Styrene*
 - k. Trichlorethylene*
 - l. Tolulene*
 - m. Xylene*

*High-priority ototoxin

**Appendix E
Earplug and Carrying Case Requisition Information**

STANDARD ITEMS:

Type & Size	Nomenclature	NSN	Fitting Requirements
Triple-flange (small) \$3.88 / package	Earplug, hearing protection, triple-flange 24 ea. / package (12 pair)	6515-00-442-4821	Small size fits (~10%) Size fitting <u>REQUIRED</u> (contact fitting POC below)
Quad-flange (regular size - fits most) \$69.97 / box	Earplug, hearing protection, quad-flange, 100 pair / box	6515-01-461-7897	Reg size fits most (~90%) Size fitting <u>REQUIRED</u> (contact fitting POC below)
Triple-flange (large) \$3.93 / package	Earplug, hearing protection, triple-flange 24 ea. / package (12 pair)	6515-00-467-0092	Large size fits (~5%) Size fitting <u>REQUIRED</u> (contact fitting POC below)
Foam Earplugs Hand-formed \$29.58 / box	Earplug, hearing protection, Foam, 200 pair / box (orange/green color)	6515-00-137-6345	Orange color must not show after insertion Disposable "back-up" use
Earplug Carrying Case \$7.61 / package	Earplug carrying case 20 / package	6515-01-100-1674	

OPTIONAL ITEMS:

Combat Arms (regular) \$369.77 / package	Combat Arms Earplug, (Double-ended) 100 ea. / package (50 pair) Requires user instruction sheet	6515-01-466-2710 Optional Item	Reg size fits most (~80%) Size fitting & Instruction sheet <u>REQUIRED</u>
Combat Arms (small) \$349.83 / package	Combat Arms Earplug, (Single-ended) 200 ea. / package (100 pair)	6515-01-512-6072 Optional Item	For smallest ears (~20%) Size fitting <u>REQUIRED</u>
Quad-flange (small) \$139.93 / package	Earplug, hearing protection, 4-flange, 200 ea. / package (100 pair)	6515-01-461-7931 Optional Item	Option for all small ears Size fitting <u>REQUIRED</u>

AVIATION ITEMS:

Communication Ear Plug (CEP) Disposable \$32/box	CEP, (disposable) 25 pairs/box	Peltip 2 Disposable "back-up" use. Combination HPD and communication device	No size fitting required
Communication Ear Plug (CEP) \$36/box	CEP, (reusable) 100 pairs/box	Peltip 1 Reusable combination device	No size fitting required
Ear Canal Caps	EAR Flex 28 Semi-Aural	NSN 6561-01-149-4133	No size fitting required
Noise muffs	Aural protector sound Type II	NSN 4240-00-022-2946	No size fitting required

Example of Standard requisition:

SAMPLE ORDER FOR COMPANY SIZE UNIT (100-160 Personnel):

- 2 PG SM Triple flange (6515-00-442-4821) = \$ 7.76
- 2 Box REG Quad-flange (6515-01-492-0443) = \$139.94
- 2 PG LG Triple flange (6515-00-467-0092) = \$ 7.86
- 6 PG of Ear Plug Cases (6515-01-100-1674) = \$ 45.66
- 2 Box Foam Plugs (6515-00-137-6345) = \$ 66.42 (Always keep 2 boxes on hand)

Estimated Total Cost: = \$ 267.67

Note: Prices are estimates and may change.

Points of Contact:

Earplug Fitting and Instructions: Installation Hearing Conservation Program Manager at (270) 956-0305.

Appendix F
HEARING READINESS CLASSIFICATION SYSTEM

<i>CLASS I</i>	Soldier's unaided hearing is within H-1 standards for both ears. No corrective action is required. (Standards are described in AR 40-501).
<i>CLASS II</i>	Soldier's unaided hearing is within H-2 or H-3 standards. Soldier has a current hearing profile assigned (H-2 or H-3), and a completed MOS/Medical Retention Board (MMRB) (H-3) with no active middle ear disease or medical pathology in the ear. If A Soldier wears hearing aids, he must have hearing aids appropriate for hearing loss and a six month supply of batteries. No corrective action is required.
<i>CLASS III</i>	Soldiers who do meet hearing readiness standards: Soldier's unaided hearing is within H-2 or H-3 standards and no current hearing profile assigned. Comprehensive audiologic examination is required to establish profile and/or need for hearing aids.
<i>CLASS IV</i>	Soldiers who do not have a DOEHRS-HC audiogram in their medical record within one year. Soldier requires a hearing examination. This includes Soldiers without a reference baseline audiogram (DD Form 2215) or whose last periodic audiogram (DD Form 2216) is greater than one year old. Hearing readiness classification is unknown.
Table Note: Soldiers in Class 1 and Class 2 will be considered fully ready. Soldiers in Class 3 or Class 4 are deficient. Soldiers in Class 3 or 4 at the time of medical record screening will immediately be reclassified in MEDPROS after obtaining corrective hearing/hearing aid services.	