

## AUDIOMETRIC TEST BOOTH SURVEY

IH UIC:	Activity:	UIC:	Field Office:						
Bldg./HULL#:	Shop Location:		Shop Code/Name:						
Shore Stationary Booth	MOHCAT/MOHCAV Booth		Shipboard Booth						
Pier-side/Cold Iron	Pier-side/Lit-Off		Underway		Speed (knots):				
Booth Manufacturer:		Serial/Prop #:							
Booth Location (Bldg./Rm/Space):		Walled:		Booth Lights:		Booth Fan:			
Types of Audiometric Testing		Octave Band Center Frequency (Hz) *Max SPL allowed (dB)						**Meets specifications to conduct this type of audiometric testing - (Yes/No)	
		125	250	500	1000	2000	4000		8000
Medical Surveillance Testing (Ears Covered) - HCP (2215/16), physical exams, PHA's, etc.		N/A	N/A	27	29	34	39	41	
Diagnostic Audiology Testing (Ears Covered) – supra-aural headphones		35	25	21	26	34	37	37	
Diagnostic Audiology Testing (Ears Covered) – insert earphones		59	53	50	47	49	50	56	
Diagnostic Audiology Testing (Ears Not Covered) - Sound field testing or bone conduction testing		35	21	16	13	14	11	14	
SPL Measured Inside Booth (dB)									DOEHRS Sample #
SPL Measured Outside the Booth (Info Only):			(dBA):			(dBc):			
DOEHRS Sample #									
Field Calibration: Pre-Calibration Date: _____ Time: _____			Ref dB/measured dB: _____ / _____			Field Calibration: Post-Calibration Date: _____ Time: _____			Ref dB/measured dB: _____ / _____
Field Calibration OK: _____ Field Calibrated By: _____									
Equipment Data	Manufacturer	Model #			Serial #			Cal Date	
SLM									
Microphone									
Octave Band Filter									
Calibrator									

Signature

Date

\* Max permissible ambient noise level (MPANL) criteria per ANSI S3.1, 1999 (R2023) and DODI 6055.12, Latest Edition

\*\* Any significant new noise (inside or outside the booth) or relocation of the booth requires a new survey

## Audiometric Test Booth Survey Procedures

**I. References:**

- (a) NMCPHC TM6290.91, Latest Edition. Industrial Hygiene Field Operations Manual, Chapter 5
- (b) NMCPHC TM6260.51-99, Latest Edition. Navy Medicine Hearing Conservation Program Technical Manual
- (c) American National Standards Institute. 2018. American national standard maximum permissible ambient noise levels for audiometric test rooms (ANSI/ASA S3.1-1999 (R2023)
- (d) Chung, K. 2023. Calibration matters: I. Sound level meter basics. *Journal of Communication Disorders*, 101, 106300. <https://doi.org/10.1016/j.jcomdis.2022.106300>

### **II. Background Information**

- **Annual Survey Required:** All audiometric booths require a survey at least annually (every 365 days).
- **Coordination with Audiologist:** Essential to determine the types of audiometric testing conducted in the booth, as there are four distinct approval criteria based on booth purpose.

### **III. Instrumentation**

- **Minimum Requirement:** Type 1 sound level meter (SLM) with a 1/1 octave band filter/analyizer (OBA). Note: Depending on the manufacturer of the Type 1 SLM, a one-inch microphone may be required.
- **Self-Noise:** The SLM, OBA, and microphone's self-noise must be at least 3 dB below the applicable "Max SPL" criteria in the survey table.
- **Calibration:** The SLM, OBA, microphone, and calibrator must each have been professionally calibrated within the past year.

### **IV. Measurement Procedures**

1. **Operating Conditions:** Obtain measurements inside the booth during normal operational conditions (lights, ventilation on) and activity levels representative of anticipated use.
2. **Frequencies:** Take readings at all frequencies listed on the survey, measuring one octave below the lowest testing frequency.
3. **Calibration Check:** Perform pre- and post-field calibration of the SLM.
4. **Settings:** Select the 1/1 OBA, flat or linear weighting, and slow response mode.
5. **Microphone Placement:** Position the microphone at the center of the seat, where a listener's head would normally be.
6. **Reading and Recording:** Select the octave band screen, take the sound pressure levels (SPLs) at the required frequencies, and record. (Note: Check levels at seats closest and furthest from the door; record the higher values.)
7. **External Noise:** Have someone talk outside the booth to assess impact on testing. If conversation invalidates testing, annotate this on the survey.
8. **Record Data:** Document SPLs, pertinent details, and equipment information on the survey as indicated.

#### **9. Self-Noise Correction:**

- **If "Max SPL" is 10 dB or higher than the self-noise, no correction is needed.**
- **If self-noise is 3-10 dB below "Max SPL", apply this correction:**

$$L_{ActualAmN} = 10\log(10^{MeasuredAmN/10} - 10^{SLMSelfN/10}), \text{dB SPL}$$

- **Where:**

- **L<sub>ActualAmN</sub>:** Actual ambient sound level generated by the background, corrected for the instrument's self-noise.
- **MeasuredAmN:** Total ambient noise level measured including the instrument's self-noise.
- **SLMSelfN:** Self-noise level of the instrument.

### **V. Completion and Documentation**

- Sign, date, and post the survey on the exterior of the booth or adjacent wall.
- Retain a file copy.

### **VI. Mobile Occupational Health Conservation Audiometric Vehicles/Trailers (MOHCAV/MOHCAT)**

- Follow the procedures above.
- Conduct the survey at primary customer locations/the locations most often used, with realistic external noise.
- **Impractical to re-survey after each move.** Occasional cross-traffic, generators, flyovers, and small crafts pier-side all have the potential to invalidate test results. Some alternatives to ensure test validity:
  - Conduct/document booth survey at each prospective test location in worst case conditions.
  - Do a test audiogram (on a normal listener) at each location prior to beginning patient care

### **VII. Shipboard Booths**

- Pier-side surveys are invalid for underway use. Surveys must be evaluated and annotated under representative underway conditions.

### **VIII. Re-Survey Trigger**

- Any significant new noise (inside or outside) or relocation of the booth requires a new survey.