

INCH-POUND

MIL-DTL-83511A
w/AMENDMENT 1
19 September 2012
SUPERSEDING
MIL-DTL-83511A
11 March 2004

DETAIL SPECIFICATION

HEADSET-MICROPHONE AND HEADSET-ELECTRICAL
(MEDIUM NOISE ATTENUATION, HEARING PROTECTIVE),
GENERAL SPECIFICATION FOR

This specification is approved for use by all Departments
and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification covers headsets and headset-microphone assemblies intended for use in medium ambient noise level environments of 85-105 dBA SPL (Sound Pressure Level). These headset-microphone assemblies use dynamic earphones of the moving coil type that transform electrical energy into acoustical energy. A complete assembly includes headband, earphone(s) mounted in rigid earcups, with cord assemblies to meet requirements of various military service activities. The assemblies include, as required, a noise canceling microphone and boom.

2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3, 4, or 5 of this specification. This section does not include documents cited in other sections of this specification or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements of documents cited in sections 3, 4, or 5 of this specification, whether or not they are listed.

2.2 Government documents.

2.2.1 Specifications, standards, and handbooks. The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract.

FEDERAL STANDARD

FED-STD-595/26329 - Gray, Semigloss.

Since Navy-EC is the Navy custodian for this document, all Navy review activities should forward their comments directly to DLA Land and Maritime. Beneficial comments, recommendations, additions, deletions, clarifications, etc., and any data that may improve this document should be sent to: DLA-CC, DLA Land and Maritime, ATTN: VAI, P.O. Box 3990, Columbus, Ohio 43218-3990 or emailed to sound@dsccl.dla.mil. Since contact information can change, you may want to verify the currency of this address information using the ASSIST Online database at <https://assist.dla.mil>.

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DEPARTMENT OF DEFENSE SPECIFICATIONS

MIL-J-641/8	-	Jacks, Telephone, Type JJ-055
MIL-DTL-641/22	-	Jacks, Telephone, U-385/U
MIL-P-642/7	-	Plugs, Telephone (Type PJ-292) and Accessory Screws
MIL-DTL-642/14	-	Plugs, Telephone (Type U-384/U) 5 Conductor, Single
MIL-DTL-14072	-	Finishes for Ground Based Electronic Equipment
MIL-A-23595	-	Amplifier, Audio Frequency
MIL-PRF-25670/2	-	Earphone Element, High and Low- altitude, H-143/AIC, and Low-Altitude, Water-Immersible, H-143A/AIC
MIL-PRF-25670/5	-	Earphone Element, 1000 Ohm Ground Level, Water-Immersible, M25670/5-01
MIL-PRF-26542/2	-	Microphone and Microphone Assemblies, M87/AIC M26542/2-01, M26542/2-02, M26542/2-03, and M26542/2-04
MIL-PRF-26542/10	-	Microphone Assembly, M-138/G
MIL-DTL-55116	-	Connectors; Miniature Audio, Five Pin and Six Pin, General Specification for
MIL-DTL-55668	-	Cord, Electrical; Audio, Subminiature (Retractable and Straight)

(See supplement 1A for list of specification sheets.)

DEPARTMENT OF DEFENSE STANDARDS

MIL-STD-202	-	Electronic and Electrical Component Parts
MIL-STD-810	-	Environmental Engineering Considerations and Laboratory Tests
MIL-STD-1285	-	Marking of Electrical and Electronic Parts

(Copies of these documents are available online at <https://assist.dla.mil/quicksearch/> or from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.)

2.2.2 Other Government documents, drawings, and publications. The following other Government documents, drawings, and publications form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract.

DSCC Drawings

SC-DL-34036	-	Connector, Plug U-161()/U
66B870	-	Bracket, Microphone - MT-2007/AIC, Headset, Assembly of

(Copies of this document required by contractors in connection with specific acquisition functions may be obtained from the procuring activity at DSCC.cddwgs@dla.mil, or as directed by the contracting officer.)

2.3 Non-Government publications. The following documents from a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract.

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION (ISO)

ISO-10012	-	Measurement management systems Requirements for measurement processes and measuring equipment - Première Edition
ISO 17025	-	General Requirements for the Competence of Testing and Calibration Laboratories

(Copies of these documents are available online at www.ansi.org or from the ANSI Customer Service Department, 25 W. 43rd Street, 4th Floor, New York, NY 10036.)

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IPC - ASSOCIATION CONNECTING ELECTRONICS INDUSTRIES

- | | | |
|-----------|---|---|
| J-STD-004 | - | Requirements for Soldering Fluxes |
| J-STD-005 | - | Requirements for Soldering Pastes-Replaces QQ-S-571 |
| J-STD-006 | - | Requirements for Electronic Grade Solder Alloys and Fluxed and Non-Fluxed Solid Solders for Electronic Soldering Applications |

(Copies of these documents are available online at <http://www.ipc.org> or from the IPC - Association Connecting Electronics Industries, 3000 Lakeside Drive, Suite 309 S, Bannockburn, IL 60015-1249.)

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

- | | | |
|-----------|---|---|
| ANSI S3.5 | - | Methods for Calculation of the Speech Intelligibility Index |
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NOTE:

Although available from "ANSI", this document may be recorded as ASA S3.5, under the Secretariat "Acoustical Society of America". For additional information, contact the Standards Manager, Acoustical Society of America (ASA), 120 Wall Street, 32nd floor, New York, NY 10005-3993, USA. Telephone 1-212-248-0373. E-mail asastds@aip.org.

(Copies of this document are available from <http://www.ansi.org> or the American National Standards Institute (ANSI), 25 West 43rd Street, 4th floor, New York, NY 10036).

NCSL INTERNATIONAL

- | | | |
|-------------|---|---|
| NCSL Z540.3 | - | Requirements for the Calibration of Measuring and Test Equipment - To Purchase Call 1-800-854-7179 USA/Canada or 303-397-7956 Worldwide |
|-------------|---|---|

(Copies of these documents are available online at <http://www.ncsli.org> or from NCSL International, 2995 Wilderness Place, Suite 107 Boulder, Colorado 80301-5404.)

SAE INTERNATIONAL

- | | | |
|-------------|---|-------------------------|
| SAE-AS23899 | - | Aural Protector, Sound. |
|-------------|---|-------------------------|

(Copies of these documents are available on line at www.sae.org from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, and Tel: 877-606-7323 [inside USA and Canada] or 724-776-4970 [outside USA], email at CustomerService@sae.org.)

2.4 Order of precedence. Unless otherwise noted herein or in the contract, in the event of a conflict between the text of this document and the references cited herein (except for related specification sheets), the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations, unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 Specification sheets. The individual item requirements shall be as specified herein and in accordance with the applicable specification sheet. In the event of any conflict between requirements of this specification and the specification sheet, the latter shall govern.

3.2 Qualification. The headset or headset-microphone assemblies furnished under this specification shall be products that are authorized by the qualifying activity for listing on the applicable qualified products list (QPL) before contract award (see 4.6 and 6.2).

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3.3 Component parts. The headset or headset microphone shall consist of the component parts (see 3.1) and these components shall meet the requirements of the respective documents.

3.4 Materials.

3.4.1 Insulating and jacket compounds for cords. Insulating and jacket compounds for cords shall be in accordance with MIL-DTL-55668 or equal.

3.4.2 Temper foam. Foam filler for the ear-cushion shall be inert polyester or polyether material of medium density.

3.4.3 Solder. Solder shall be as specified in J-STD-004, J-STD-005, and J-STD-006. The solder flux shall be rosin (RO) base and in accordance with type L0 of J-STD-004.

3.4.4 Pure tin (see 6.8). The use of pure tin, as an underplate or final finish, is prohibited both internally and externally. Tin content of microphone and microphone assembly components and solder shall not exceed 97 percent, by mass. Tin shall be alloyed with a minimum of 3 percent lead, by mass.

3.5 Performance characteristics.

3.5.1 Headsets and headset-microphones. The assemblies specified herein shall not cause dermatitis by reason of selection, processing, or fabrication of components. The headset shall be designed to be worn by all military personnel, including personnel wearing eyeglasses. Upon examination, the requirements specified on figure 1 shall be met.

3.5.1.1 Weight. Unless otherwise specified, the maximum weight shall be 1.5 pounds.

3.5.1.1.1 Light weight. Headsets specified "light-weight" shall have a maximum weight of 18 ounces.

3.5.2 Metals. The metals used shall be of the proper alloy and hardness necessary to provide the required strength and rigidity with the maximum strength to weight ratio. Metals shall be of a corrosion-resistant type or shall be treated in accordance with MIL-DTL-14072, type II (sheltered).

3.5.3 Earphone assembly. The earcup shall meet the requirements shown on figure 2 and in air force drawing 66B870.

3.5.3.1 Rigid earcups. The earcups shall be fabricated from Acrylonitrile-Butadiene-Styrene (ABS) plastic or any equally suitable material. Unless otherwise specified (see 3.1), the color shall be Semigloss Gray of FED-STD-595/26329. If the earcup is constructed of more than one piece, the pieces shall be permanently joined together. All seams shall be smooth.

3.5.3.2 Earphone element mounting. The element shall be mounted in the earcup by plastic foam in such a manner that the element and cup shall be easy to assemble and disassemble. The earphone can be dropped into the inner fill foam (split to accept earphone).

3.5.3.3 Fillers. The earcup fillers shall be installed in the earcup cavity so that the material will not normally come in contact with the user's ears. The filler material used for the earcup filler for the ear-cushion shall be inert polyester or polyether material of minimum density of 3 lbs/ft³. Color is optional and shall not be treated in any manner to cause skin irritation. Unless otherwise specified, the filler shall have a cavity to accept and retain the earphone. The fillers shall be designed so that they can be removed from the earcup cavities and replaced without damage to the fillers or earcups. The filler material shall not be glued to the earcup.

3.5.3.4 Attachment provisions. The earcup shall be attached to the headband with a flat steel band yoke in accordance with SAE-AS23899.

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3.5.3.5 Earcup cushion. The cushion shall be easily replaceable and shall not be cemented to the earcup; however, it shall remain attached during normal usage. No treatments used to process the device shall cause skin irritation. The overall depth or thickness shall be .375 (9.53 mm) to .500 (12.70 mm) inch. The cushion shall not decrease the opening of the earcup. It shall form a seal around eyeglasses, and it shall not allow any appreciable ambient noise to leak into the inner chamber of the earcup (see [figure 3](#)).

3.5.3.6 Earphone element. The earphones used in this equipment shall be the type and design specified (see [3.1](#)) and shall have passed the component requirements specified.

3.5.3.7 Ear opening. The opening for the ear in the rigid earcup shall be not less than 2.8 inches (71.12 mm) long and 1.7 inches (43.18 mm) wide, rounded symmetrically (see [figure 4](#)). Wall thickness and external dimensions shall be held to a minimum so that good sound attenuation shall be provided.

3.5.3.8 Earphone mechanical stability. The stability of the diaphragm material and concentricity of the moving coil and air gap shall not be affected by extended aging and exposure to the environmental condition specified herein.

3.5.4 Headband and headband parts. The headband shall be single band, slide adjustable.

3.5.4.1 Yoke and earcup (see figures 5 and 6). The yoke shall be attached to the earcup in any manner to provide a free pivot point for the earcup. The width of the yoke shall not exceed .25 inch (6.35 mm). The 2.37 inches (60.20 mm) dimension is intended as suggested distance to provide earcup clearance to the yoke. The 0.31 inch (7.87 mm) dimension shows suggested junction of yoke to earcup.

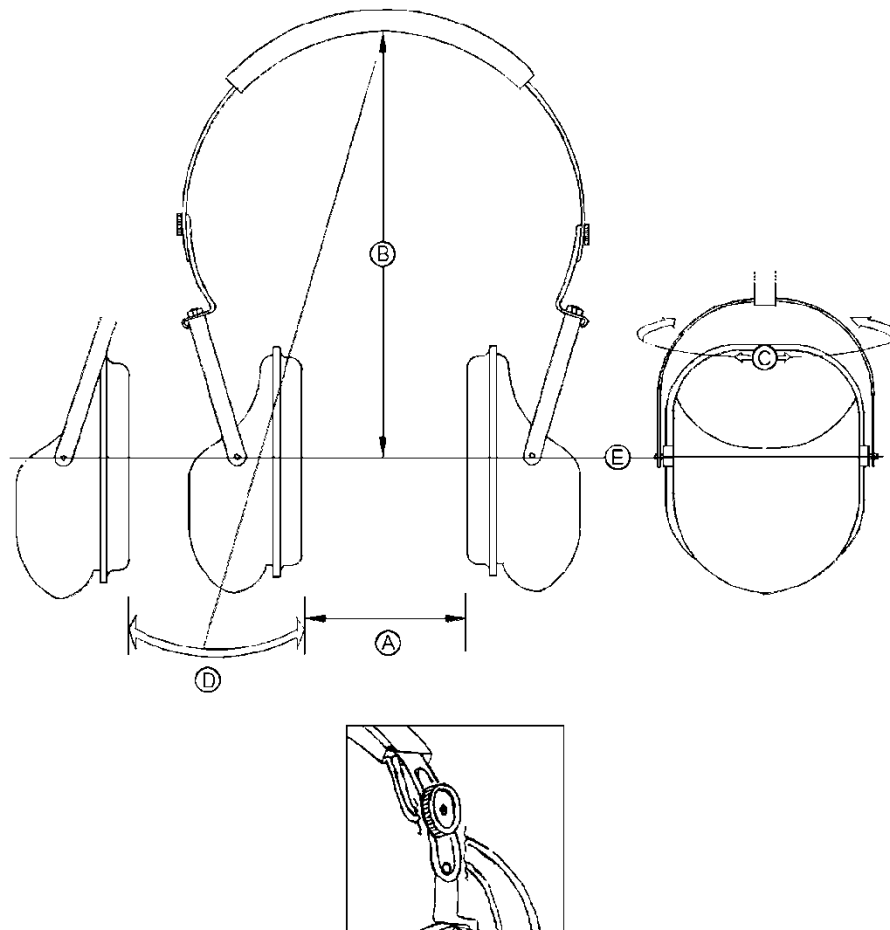
3.5.4.2 Yoke and headband (see figures 6 and 7). The junction of the yoke and headband shall allow for lateral movement of 5 degrees of angle, to either side of centerline. Method of attachment and stop for articulation requirements shall be optional.

3.5.4.3 Headband (see figure 7). The headband and headband pad size shall be kept to a minimum. They shall provide support and comfort yet keep weight to a minimum. The headband adjustment mechanism would be manufacturer's option so long as envelope requirements are maintained. The tension provided on the adjustment slides shall be adequate to retain the headset-microphone in its position under a steady state acceleration G level of 2. Provisions shall be made for the overhead cord through the headband pad.

3.5.4.4 Sliding action. The sliding action on the headband assembly used for positioning the earcup over the ears shall be smooth and uniform throughout the entire extension distance. There shall be no protruding hardware or excessive wire to entangle with the oxygen mask harness for emergency donning of an oxygen mask. The tension provided on the adjustment slides shall be adequate to retain a headset-microphone in its position under a forward steady state acceleration G level of 2. An alternate method of positioning is positive locking by tightening a thumbnut (see [figure 1](#)).

3.5.5 Microphone boom, cable, connector (see figure 8). A microphone boom shall be provided with each headset-microphone. The boom shall be attachable to the headset with a positioning device, which shall provide a noncritical adjustment to obtain a torque of 30 to 50 ounce inches. The microphone supporting and adjustment assembly shall be designed for easy removal, cables to be provided to connect microphone output to main cable. A branch circuit cable shall be provided on the main cable junction. A cable shall also be provided from the microphone, parallel with the boom to the branch cord connector of the main cord. Miniature cable connectors shall be provided on the microphone cables. Connectors type U-173/U and type U-172/U shall be used. Main cable microphone branch shall terminate in a U-172/U female.

3.5.6 Headsets with complex switching or output circuits. Headsets and headset-microphones with complex switching or output circuits shall be as specified (see [3.1](#)).

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Alternate locking thumbnut configuration.

NOTES:

1. Dimension "B" - 4.57 inches (116.08 mm) in with dimension "A" set to 5.12 inches (130.05 mm); "B" shall be 5.59 inches (141.99 mm) when "A" is set to 6.10 inches (154.94 mm).
2. The force required to maintain "A" dimensions of 6.10 (154.94 mm) shall not be greater than 3.5 pounds.
3. Angular deflection "C" shall be ± 5 degrees, with respect to axis "E".
4. Angular deflection "D" - the earcup plane shall be freely movable between vertical and an angle of 5 degrees (top-out, bottom-in) at all settings of dimension "A".
5. Angular displacement from 0 degrees (or neutral position) shall not generate couples resulting in uneven earseal pressure.
6. The earcup shall be suspended by yokes (stirrups) from the headband to allow quick adjustment and suitable pressure against the head of the user.
7. Dimensions are in inches. Tolerance is $\pm .010$ inch, unless otherwise specified.

FIGURE 1. Headset assembly - general configuration, adjustability details.

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3.5.7 Cords, cables, and connectors.

3.5.7.1 Headset cords. Unless otherwise specified (see 3.1), there shall be 4 (four) cords provided with each headset assembly (see figures 9 and 10), as follows:

- a. Overhead cord, Interconnect of earphones - This cord may also be used as a separate earphone channel for stereo application.
- b. Microphone boom cord - (see 3.1).
- c. Earcup microphone cord - (see 3.1).
- d. Main cord - Terminus of the three cords above. This cord shall provide input/output circuits to connector U-384/U, in accordance with MIL- DTL-642/14 and mate with a connector U-385/U, in accordance with MIL- DTL-641/22.
- e. Cords shall be in accordance with MIL-DTL-55668 for subminiature rubber covered cable.

3.5.7.2 Headset main connector. All headset assemblies covered by this specification shall have their main cords terminated in a type U-384/U, five conductor male plug in accordance with MIL-DTL-642/14, unless otherwise specified (see 3.1).

3.5.7.3 Cordage (see figure 9). The headset shall be provided with an electrical cable connected to each earphone and terminating circuit (to connect a microphone) the other end of which is terminated with a telephone plug type U-384/U. The free length of the cable shall be 10 inches. The branch circuit shall terminate in a U-172/U jack.

3.5.8 Microphone. The microphone used in this equipment shall be the type and design specified (see 3.1) and shall be a product, which has passed the component requirements specified (see 4.5).

3.5.9 Microphone mounting.

3.5.9.1 Interface. The microphone bracket and boom shall be as specified on figures 11 and 12 (see 3.1).

3.5.9.2 Microphone boom bracket and cable termination mold. Microphone boom bracket and cable termination mold shall be as specified (see figure 13) and Air Force drawing 66B870 (see 3.1). (Alternate method) Microphone boom bracket support assembly is mounted directly to the earcup with the same action for microphone (see 3.1).

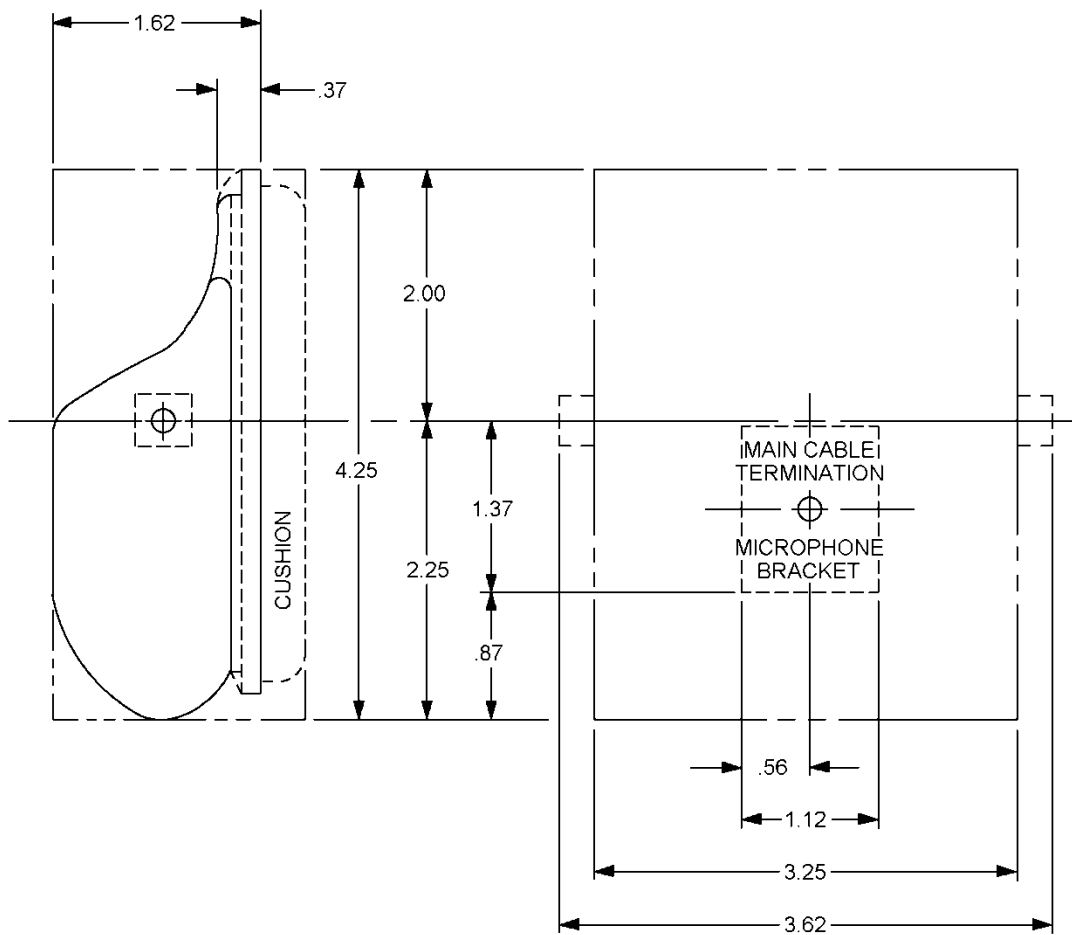
3.5.9.3 Microphone boom assembly. Each microphone shall be supplied with its respective boom assembly in accordance with table I.

TABLE I. Microphone boom.

Headset-microphone (see figures 11, 12, and 13)	Reference specifications
H-157A/AIC	MIL-DTL-83511/2 and MIL-PRF-26542/2
H-161F/GR	MIL-DTL-83511/4 and MIL-PRF-26542/10
H-172A/AIC	MIL-DTL-83511/5 and MIL-PRF-26542/2
H-182A/PT	MIL-DTL-83511/8

3.5.10 Clothes clip. When specified (see 3.1), the clothing clip shall be as shown on figure 14.

3.5.11 Transistorized amplifier. When specified (see 3.1), the transistorized amplifier shall be type M23595/1-2 (AM-3597C/A) in accordance with MIL-A-23595 or equal.

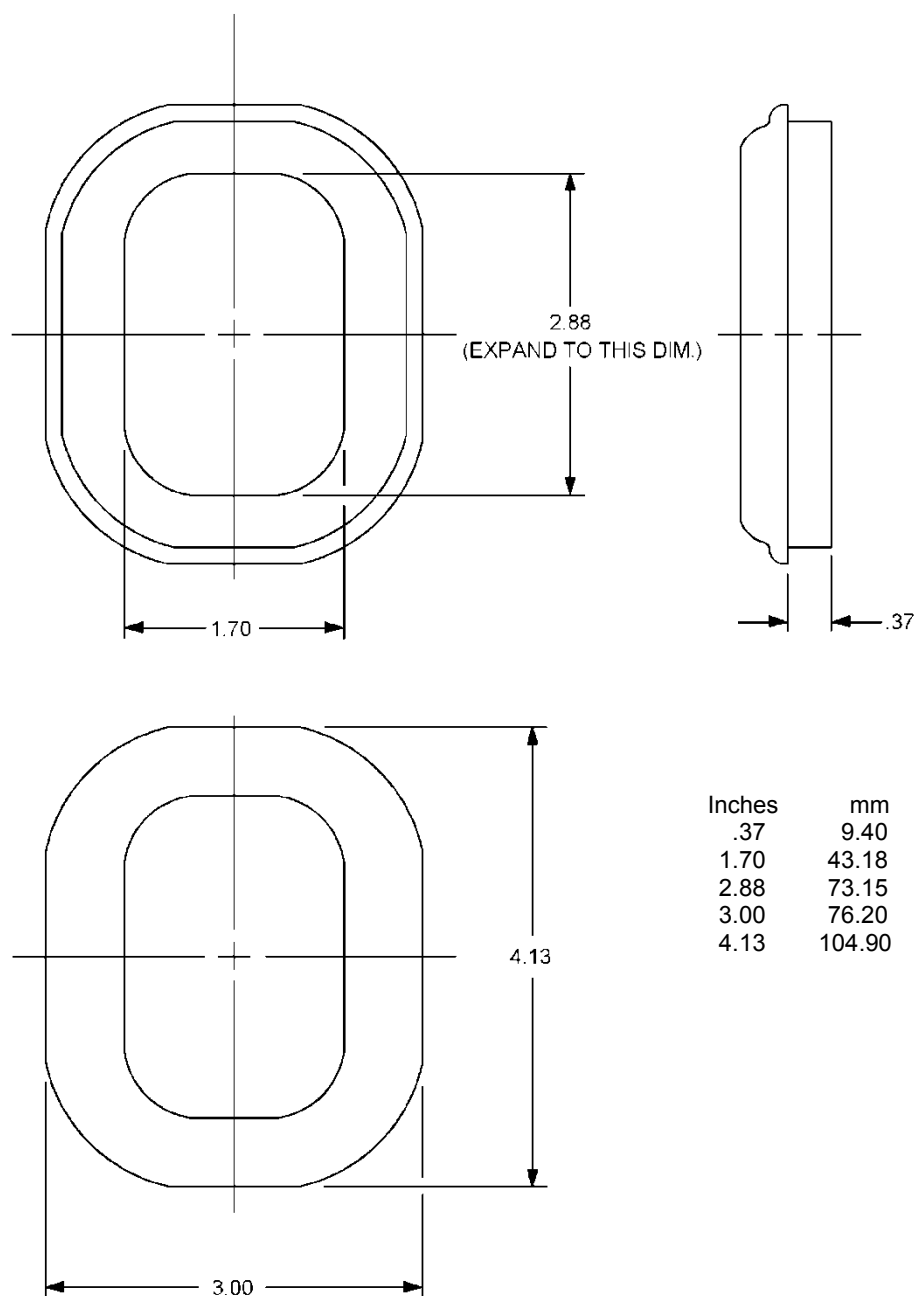
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Inches	mm
.37	9.40
.56	14.22
.87	22.10
1.12	28.45
1.37	34.80
1.62	41.15
2.00	50.80
2.25	57.15
3.25	82.55
3.62	91.95
4.25	107.95

NOTE: Dimensions are in inches. Tolerance is ± 0.010 inch (0.25 mm), unless otherwise specified.

FIGURE 2. Interface earcup envelope with cushions and cord.

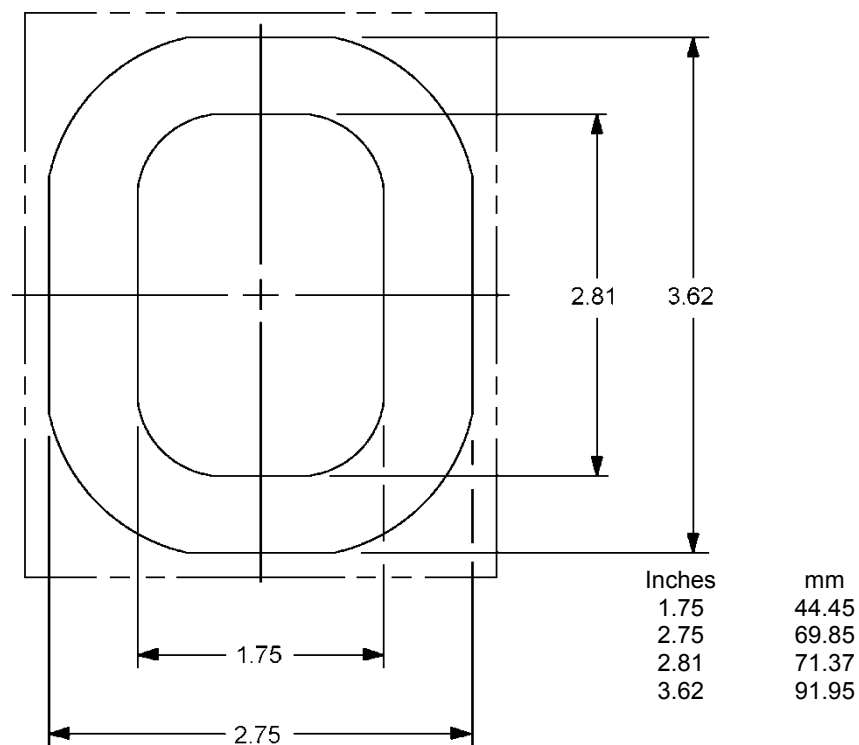
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NOTE: Dimensions are in inches. Tolerance is ± 0.010 inch (0.25 mm), unless otherwise specified.

FIGURE 3. Cushion.

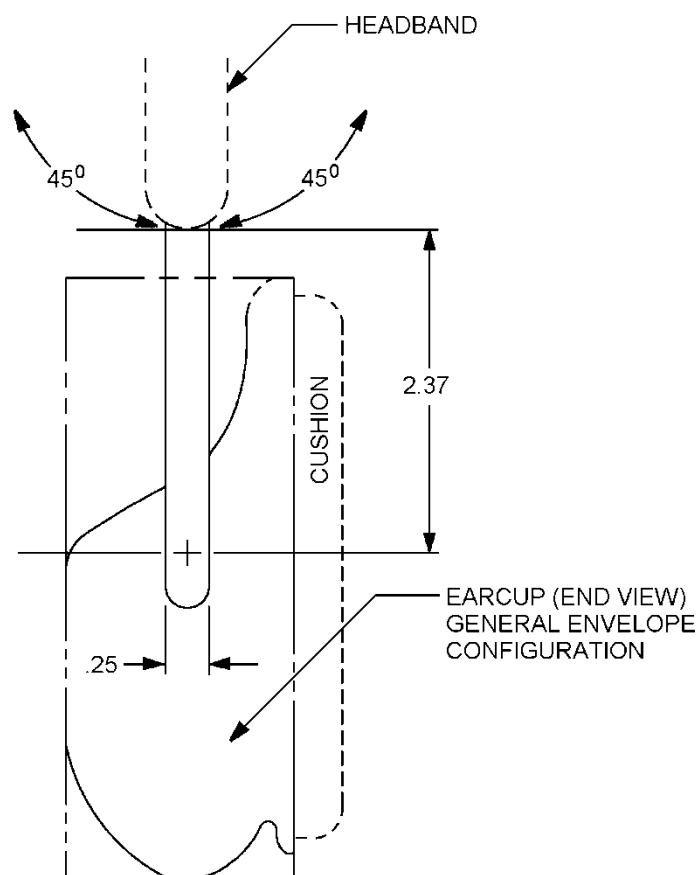
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NOTE: Dimensions are in inches. Tolerance is ± 0.010 inch (0.25 mm), unless otherwise specified.

FIGURE 4. Flange for mounting cushion to earcup.

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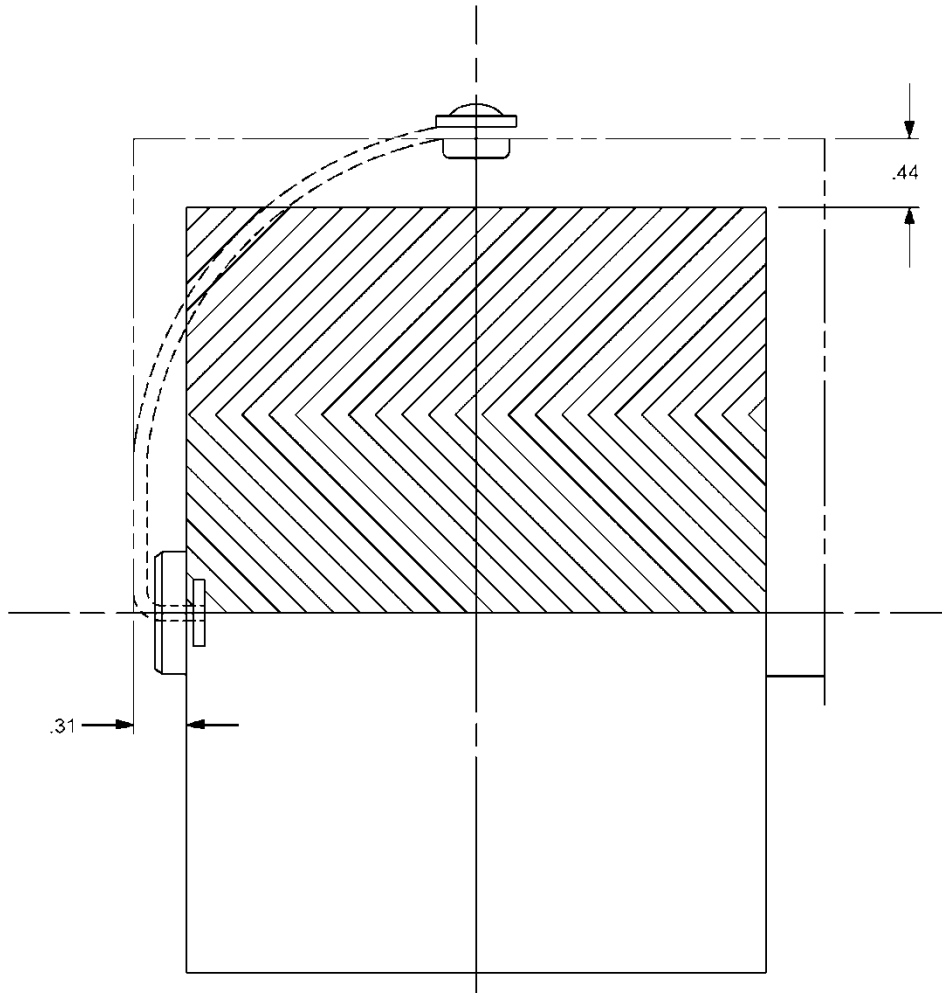


Inches	mm
.25	6.35
2.37	60.20

NOTE: Dimensions are in inches. Tolerance is ± 0.010 inch (0.25 mm), unless otherwise specified.

FIGURE 5. Interface - stirrup - earcup.

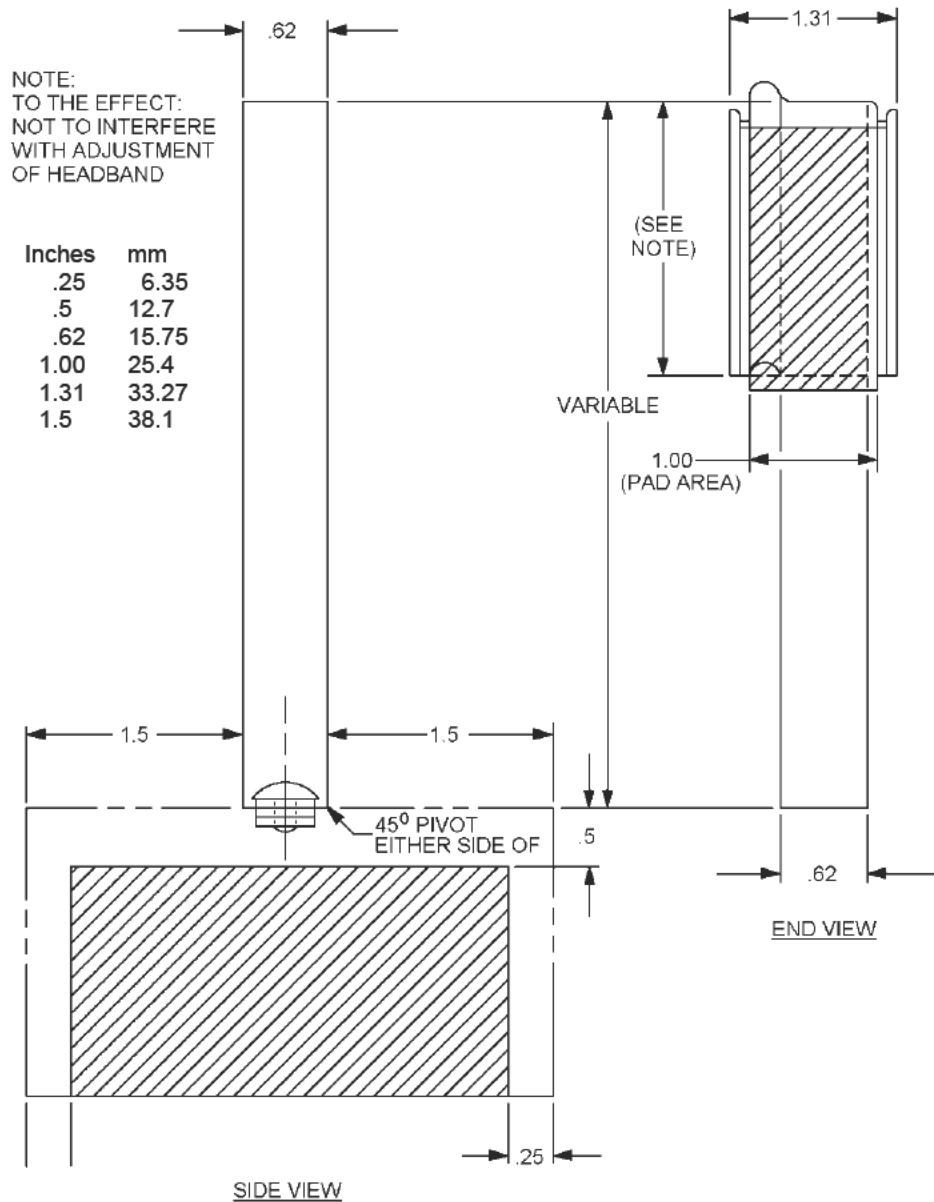
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Inches	mm
.31	7.87
.44	11.18

NOTE: Dimensions are in inches. Tolerance is ± 0.010 inch (0.25 mm), unless otherwise specified.

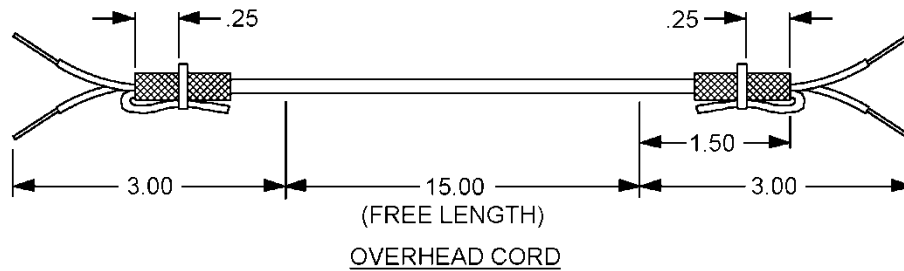
FIGURE 6. Interface yoke headband.

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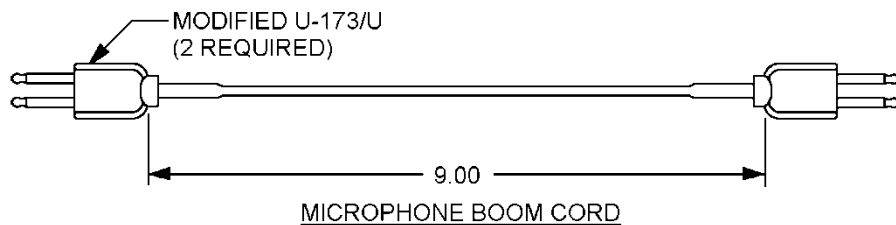
NOTE: Dimensions are in inches. Tolerance is ± 0.010 inch (0.25 mm), unless otherwise specified.

FIGURE 7. Interface yoke headband end view and side view.

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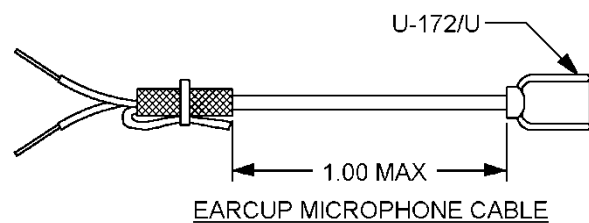


Overhead cord is applicable to all sets.



Inches	mm
.25	6.35
1.00	25.4
1.50	38.1
3.00	76.2
9.00	228.6
15.00	381.0

Microphone boom cord is applicable to all sets using MIC's.

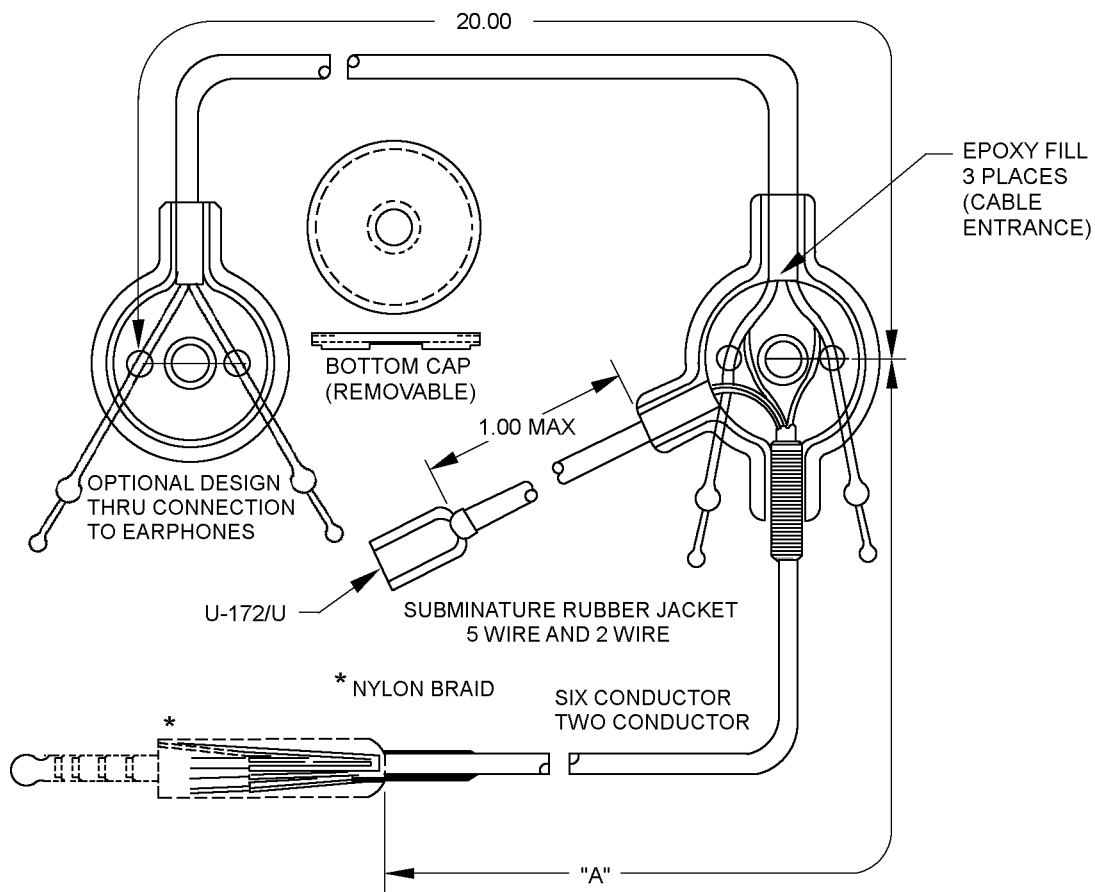


This cable may be deleted at the option of the manufacturer provided the U-172/U termination is molded into the earcup.

NOTES

1. The 2 connectors U-172/U and U-173/U are interchangeable with the JJ-055 and P-292 in accordance with MIL-J-641/8 and MIL-P-642/7 or CINCH P/N 119547 and 119563 or Nexus P/N MJ-101 and MP-101 or equal. JJ-055 and PJ-292 are QPL items.
2. Dimensions are in inches. Tolerance is ± 0.010 inch (0.25 mm), unless otherwise specified.

FIGURE 8. Miniature cable assemblies.

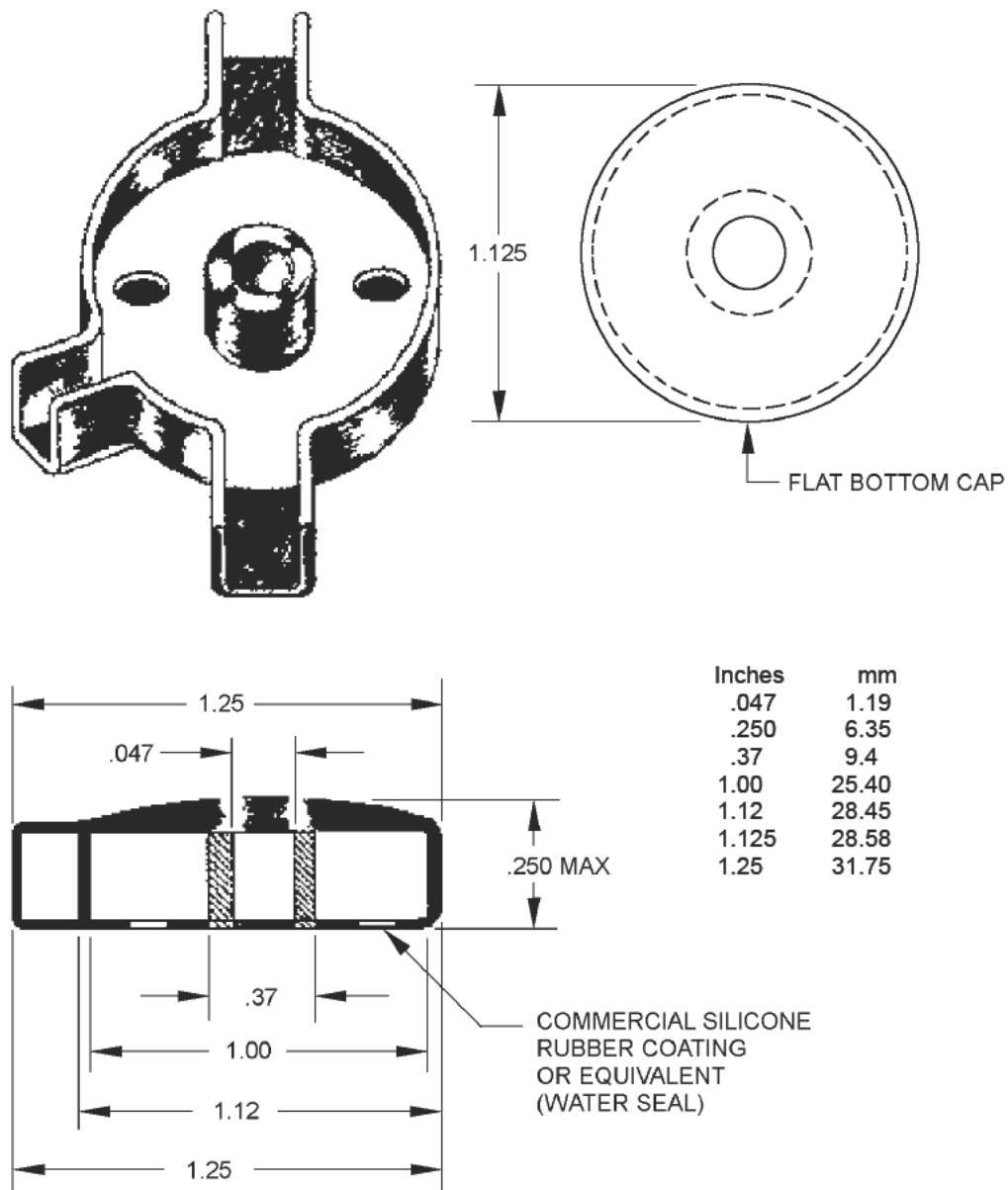
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NOTES:

1. Length "A" is 10.00 (254 mm) or 24.00 (609.60 mm) inches (see 3.1).
2. Dimensions are in inches. Tolerance is ± 0.010 inch (0.25 mm), unless otherwise specified.
3. Actual layout at option of manufacturer and the approval of the contracting officer.

Inches	mm
1.00	25.4
10.00	254.0
20.00	508.0
24.00	609.6

FIGURE 9. Optional cable layout with block (functional).

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NOTE: Dimensions are in inches. Tolerance is ± 0.010 inch (0.25 mm), unless otherwise specified.

FIGURE 10. Cable termination block detail (optional).

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3.6 Performance characteristics.

3.6.1 Microphone performance characteristics. Microphones shall meet the requirements specified (see 3.1 and 4.5).

3.6.2 Earphone performance characteristics. Earphones and earphone elements shall meet the requirements specified (see 3.1 and 4.5).

3.6.3 Performance characteristics of headset and headset-microphone.

3.6.3.1 Sound attenuation. When the equipment is tested as specified in 4.8.4.1, it shall meet the attenuation requirements specified on figure 15, and shall be recorded in the "mean" and "standard deviation" format.

3.6.3.2 Talk. When tested as specified in 4.8.4.2, the headset or headset-microphone shall operate satisfactorily. The words will sound clear and distinct.

3.6.3.3 Slide adjustment. When the headset is tested as specified in 4.8.4.3, the assembly shall have a smooth, snug, push fit on the rod. A force of 25 to 75 ounces shall be required to move the rod in the sub-assembly. Alternate method of adjustment with a thumbnut loosened, the headset shall have a smooth, push fit on the rod. When the thumbnut is tightened, the assembly should be stationary (see figure 1).

3.6.3.4 Strain relief. When the headset is tested as specified in 4.8.4.4, there shall be no slippage of the cord or cable assembly out of the plug.

3.6.3.5 Random drop. When tested as specified in 4.8.4.5, there shall be no loosening or deformation of parts or other damage to the headset. The headset shall meet the talk requirements (see 3.6.3.2) and visual and mechanical inspections in accordance with 3.1, 3.3, 3.4, 3.5, 3.7 and 3.8.

3.6.3.6 Fungus. When tested, as specified in 4.8.4.6, the headset-microphone shall show no evidence of mechanical failure. There shall be no flaking or peeling, and the talk requirements of 3.6.3.2 shall be met.

3.6.3.7 Vibration. When tested as specified in 4.8.4.7, there shall be no loose parts or evidence of mechanical failure, and the talk requirements of 3.6.3.2 shall be met.

3.6.3.8 Temperature. When tested as specified in 4.8.4.8, there shall be no parts cracked or deformed due to extreme temperature and the talk requirements of 3.6.3.2 shall be met.

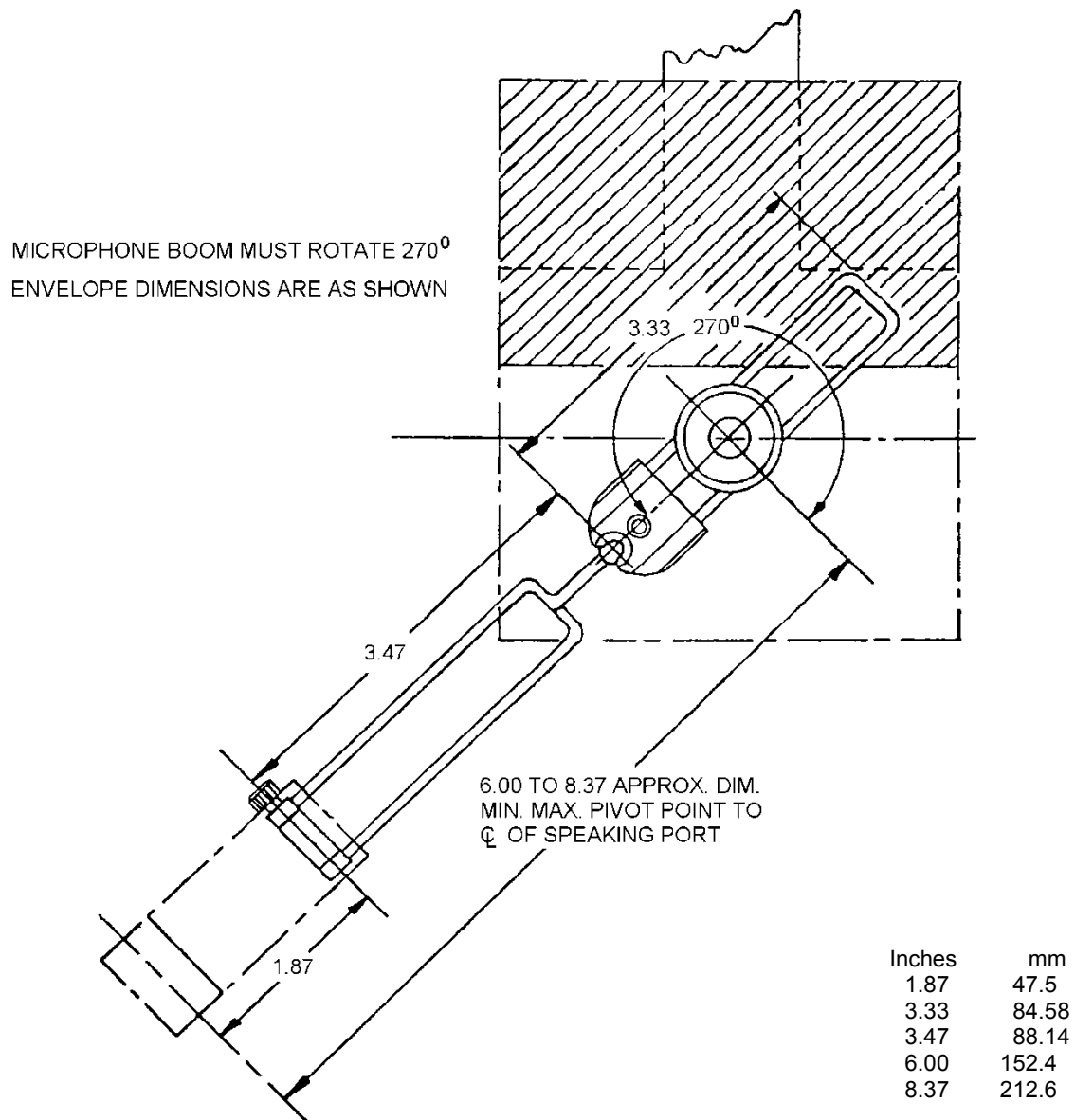
3.6.3.9 Temperature shock. When tested as specified in 4.8.4.9, there shall be no cracked or deformed parts due to extreme heat, and the talk requirements of 3.6.3.2 shall be met.

3.6.3.10 Humidity. When tested as specified in 4.8.4.10, there shall be no failure due to moisture or corrosion, and the talk requirements of 3.6.3.2 shall be met.

3.6.3.11 Shock. When tested as specified in 4.8.4.11, there shall be no failure due to broken or deformed parts, and the talk requirements of 3.6.3.2 shall be met.

3.6.3.12 Salt fog. When tested as specified in 4.8.4.12, there shall be no failure due to corrosion, and the talk requirements of 3.6.3.2 shall be met.

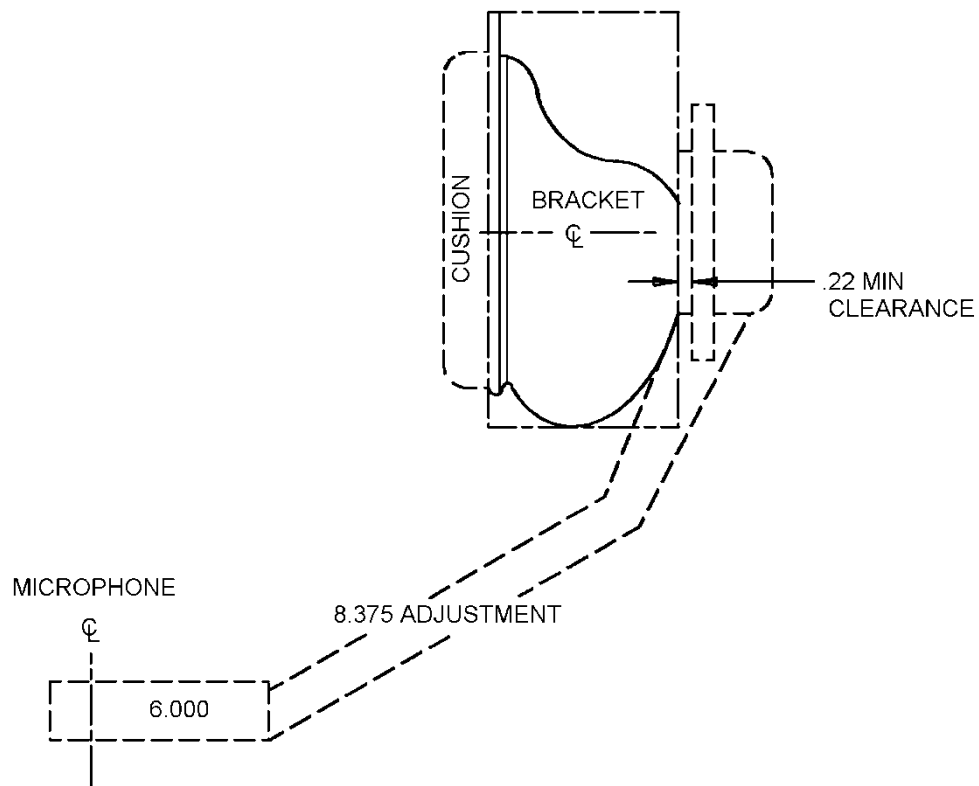
3.6.3.13 Speech intelligibility (when specified, see 3.1). When tested as specified in 4.8.4.13, the earcup with the earphone shall provide a word intelligibility score that could be expected from a distortion-free communications system with a minimum A.I. (articulation index) of 0.35.

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NOTE: Dimensions are in inches. Tolerances are ± 0.010 inch (0.25 mm), ± 2 degrees of angle, unless otherwise specified.

FIGURE 11. Interface of microphone boom bracket with cup adjustability.

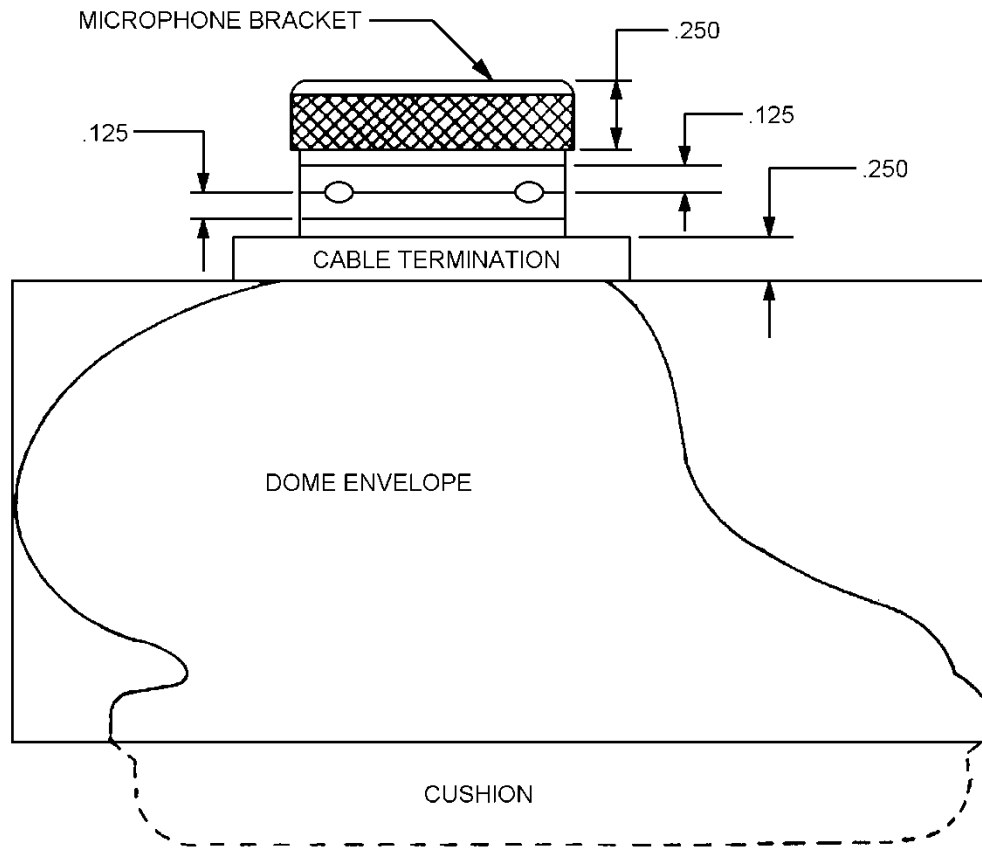
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Inches	mm
.22	5.6
6.000	152.40
8.375	212.73

NOTE: Dimensions are in inches. Tolerance is ± 0.010 inch (0.25 mm), unless otherwise specified.

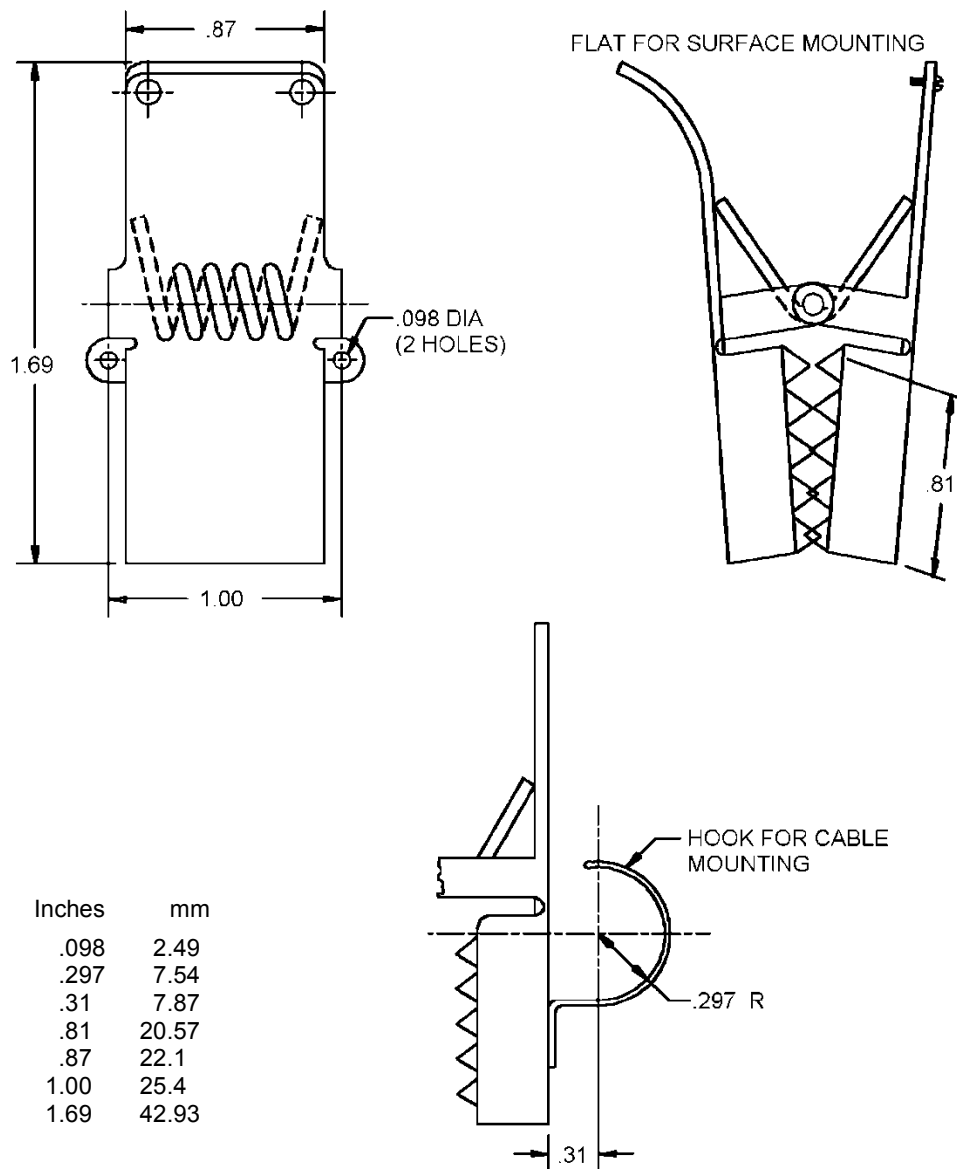
FIGURE 12. Interface of cup with boom and boom bracket (positioning with lips of speaker).

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Inches	mm
.125	3.18
.250	6.35

NOTE: Dimensions are in inches. Tolerance is ± 0.010 inch (0.25 mm), unless otherwise specified.

FIGURE 13. Microphone boom bracket and cable termination mold.

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NOTES:

1. Clothes clip shall be fastened to switch or cord assembly using appropriate attachment feature.
2. Dimensions are in inches. Tolerance is $\pm .010$ inch (0.25 mm), unless otherwise specified.

FIGURE 14. Clothes clip.

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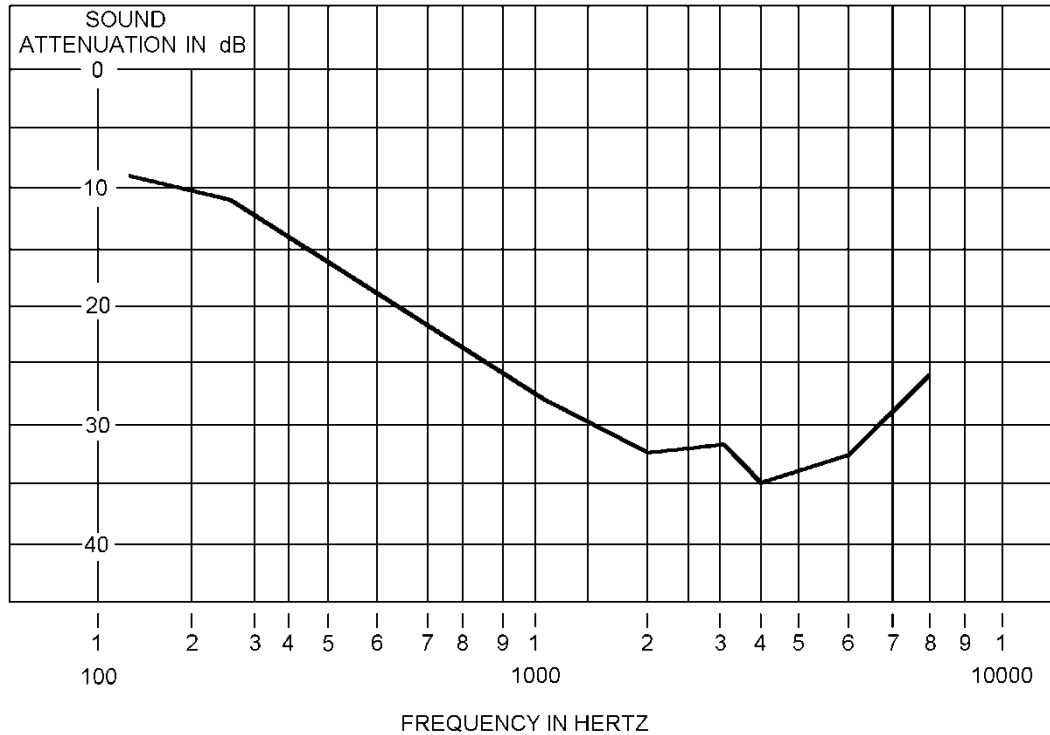


FIGURE 15. Real ear attenuation at threshold.

3.6.4 Performance characteristics of switch. When specified (see 3.1), the switch shall meet the following requirements:

3.6.4.1 Life. The switch shall be capable of 200,000 operations without a failure when tested in accordance with 4.8.5.1.

3.6.4.2 Actuator force. The force necessary, when exerted on the flat part of the bar, to activate the switch positions shall be as follows when tested in accordance with 4.8.5.2.

- a. Positions 1 and 2. The force required to maintain these positions when exerted on the flat part of the bar, at the beginning of the radius, shall be from 1 to 2 pounds.
- b. Position 3. The force required to maintain this position shall be from 1.5 to 2.5 pounds.

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3.6.4.3 Contact sequence. The switch shall provide operation in sequence (see [figure 16](#)) as follows:

- a. Off position. Switch not depressed, for monitoring telephone or radio.
- b. Position 1. Closed halfway, nonlocking, for "push-to-talk" telephone operation.
- c. Position 2. Closed halfway, pushed forward, for "lock-on" telephone operation.
- d. Position 3. Closed all the way, nonlocking, for radio remote control.

3.6.4.4 Switch details (see figure 16). The switch mechanism shall be made as follows:

- a. Off position. Without pressure on the switch, the contact gaps shall be .02 inch (0.5 mm) minimum.
- b. Positions 1 and 2. The open contact shall have a gap of .015 inch (3.81 mm) minimum. The closed contact shall develop a minimum of 15 grams force.
- c. Position 3. Both contacts shall be closed. The total force developed shall be 25 grams, minimum.

3.6.4.5 Contact resistance. When tested as specified in [4.8.5.3](#), the contact resistance shall not be over 0.05 ohm.

3.6.5 Performance of cable.

3.6.5.1 Flexing life (cable). When tested as specified in [4.8.5.4](#), the six-conductor cable shall have a mean flex life of 50,000 flexes and the two-conductor cable shall have a mean flex life of 25,000 flexes without showing evidence of damage to the insulation of the individual conductors and electrical discontinuity.

3.6.5.2 Isolation (cable). When tested as specified in [4.8.5.5](#), the electromagnetic and electrostatic isolation between the headset circuit and microphone circuit of the cable assembly shall not be less than that shown in [table II](#).

TABLE II. Isolation.

Frequency in Hz	Electrostatic isolation less connector	Electromagnetic isolation with connector
20,000	115 dB	86 dB
10,000	121 dB	92 dB
5,000	127 dB	98 dB

3.7 Marking. Headsets and headset-microphones shall be marked in accordance with MIL-STD-1285 with the type designation and manufacturer's code symbol or name.

3.8 Recycled, recovered, or environmentally preferable materials. Recycled, recovered, or environmentally preferable materials should be used to the maximum extent possible provided that the material meets or exceeds the operational and maintenance requirements, and promotes economically advantageous life cycle costs.

3.9 Workmanship. Headsets shall be processed in such a manner as to be uniform in quality and shall be free from loose or deposited foreign materials, and other defects that will affect life, serviceability, or appearance.

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4. VERIFICATION

4.1 Test equipment and inspection facilities. Test and measuring equipment and inspection facilities of sufficient accuracy, quality and quantity to permit performance of the required inspection shall be established and maintained by the contractor. The establishment and maintenance of a calibration system to control the accuracy of the measuring and test equipment shall be in accordance with ISO 10012 and either NCSL Z540.3 or ISO 17025. See 6.7, for more information on calibration laboratories and measuring and test equipment.

4.2 Classification of inspections. The inspections specified herein are classified as follows:

- a. Materials inspection (see 4.3).
- b. Components inspection (see 4.5).
- c. Qualification inspection (see 4.6).
- d. Conformance inspection (see 4.7).

4.3 Materials inspection. Materials inspection shall consist of certification supported by verifying data that the materials listed in table III, used in fabricating the equipment, are in accordance with the applicable referenced specifications prior to such fabrication.

TABLE III. Materials inspection.

Materials	Requirement paragraph	Applicable specification
Insulating and jacket compounds for cords	3.4.1	MIL-DTL-55668 or equal
Solder flux	3.4.3	J-STD-004

4.4 Inspection conditions. Unless otherwise specified, all inspections shall be performed under the following conditions:

- Temperature - Room ambient, +15°C (+59°F) to +35°C (+95°F).
- Pressure - Normal atmospheric.
- Humidity - Room ambient up to 90 percent relative humidity.

All acoustical testing shall be made in a free field environment.

4.5 Components inspection. Components inspection shall consist of certification supported by verifying data that the components listed in table IV and table V, used in the headsets, are in accordance with the applicable referenced specification.

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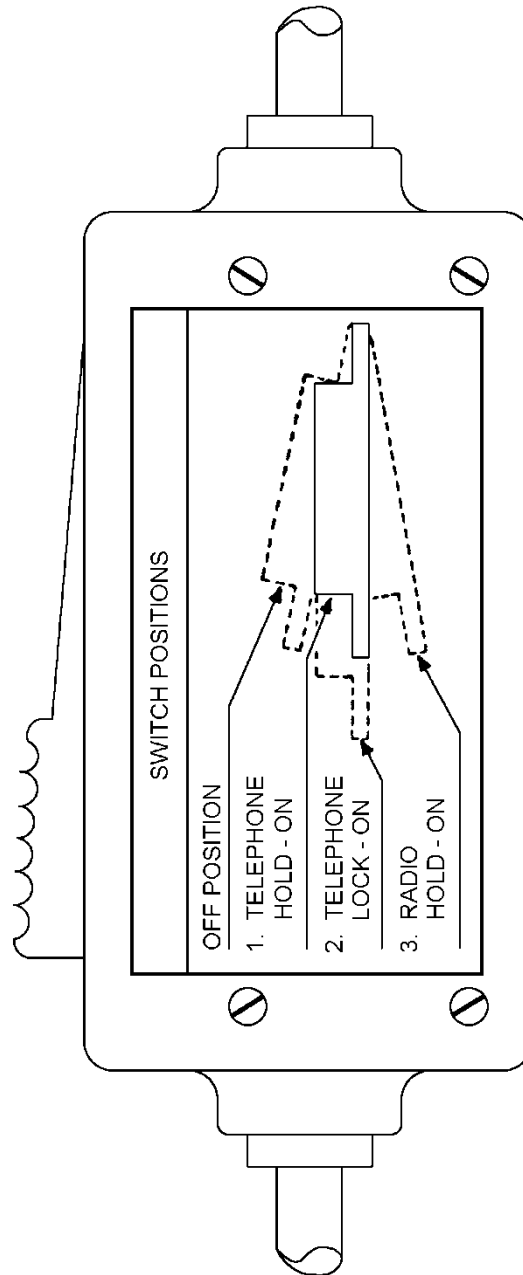


FIGURE 16. Switch.

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TABLE IV. Components Inspection.

Component	Requirements	Applicable specification
Earphones		
M25670/5-01	MIL-DTL-83511/1, /4	MIL-PRF-25670/5
H-143/AIC	MIL-DTL-83511/2, /3, /6	MIL-PRF-25670/2
020-530-002-000	MIL-DTL-83511/5	MIL-DTL-83511
H-143/AIC (Except 300 Ohms)	MIL-DTL-83511/8	MIL-PRF-25670/2 (Except 300 Ohms)
Microphones		
M-87/AIC	MIL-DTL-83511/2, /5	MIL-PRF-26542/2
M-138/G	MIL-DTL-83511/4	MIL-PRF-26542/10
N100107-01 (CAGE 7L772)	MIL-DTL-83511/8	Gentex Corp Data
Connectors, Jacks and Plugs		
JJ-055	MIL-DTL-83511/1, /2, /3, /4, /5, /6	MIL-J-641/8; (U-172/U, NEXUS Equiv.)
PJ-292	MIL-DTL-83511/2, /5	MIL-P-642/7; (U-173/U, NEXUS Equiv.)
U-229/U (5 Connector Plug)	MIL-DTL-83511/1, /4	MIL-DTL-55116
10-109614-5P	MIL-DTL-83511/4	Amphenol Data
U-384/U	MIL-DTL-83511/5, /6	MIL-DTL-642/14
U-385/U	MIL-DTL-83511/5, /6	MIL-DTL-641/22
U-161/U	MIL-DTL-83511/8	SC-DL-34036 (Army drawing)

4.6 Qualification inspection. Qualification inspection shall be performed at a laboratory acceptable to the Government (see 6.2) on sample units produced with equipment and procedures normally used in production.

4.6.1 Sample size. Six earphones, microphones, headsets, and headset-microphones shall be subjected to the qualification inspection.

4.6.2 Inspection routine. The sample shall be subjected to the inspections specified in table V, in the order shown. All sample units shall be subjected to the inspection of group I, II or III. The sample shall then be divided equally into two groups of three units each, and subjected to the inspections under groups IV and V respectively.

4.6.3 Failures. One or more failures shall be cause for refusal to grant qualification approval.

4.6.4 Retention of qualification. To retain qualification, the contractor shall forward a report at 12-month intervals to the qualifying activity. The qualifying activity shall establish the initial reporting date. The report shall consist of:

- a. A summary of the results of the tests performed for inspection of product for delivery; group A, indicating as a minimum the number of lots that have passed and the number that have failed. The results of tests of all reworked lots shall be identified and accounted for.
- b. A summary of the results of tests performed for periodic inspection; group C, including the number and mode of failures. The summary shall include results of all periodic inspection tests performed and completed during the 12-month period. If the summary of the test results indicates nonconformance with specification requirements, and corrective action acceptable to the qualifying activity has not been taken, action may be taken to remove the failing product from the qualified products list.

Failure to submit the report within 30 days after the end of each 12-month period may result in loss of qualification for the product. In addition to the periodic submission of inspection data, the contractor shall immediately notify the qualifying activity at any time during the 6-month period that the inspection data indicates failure of the qualified product to meet the requirements of this specification.

In the event that no production occurred during the reporting period, a report shall be submitted certifying that the company still has the capabilities and facilities necessary to produce the item. If during two consecutive reporting periods there has been no production, the manufacturer may be required, at the discretion of the qualifying activity, to submit the earphones to testing in accordance with the qualification inspection requirements.

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Inspection	Requirement paragraph	Test method paragraph	Sample units
<u>Group I</u> (Microphones)	3.5.8	4.5	6
<u>Group II</u> (Earphone element)	3.5.3.6	4.5	6
<u>Group III</u> (Headsets and headset-microphones)			
Visual and mechanical examination	3.1, 3.3, 3.4, 3.5, 3.7 and 3.8	4.8.1	6
Sound attenuation	3.6.3.1	4.8.4.1	
Talk	3.6.3.2	4.8.4.2	
Slide adjustment	3.6.3.3	4.8.4.3	
Strain relief	3.6.3.4	4.8.4.4	
Random drop	3.6.3.5	4.8.4.5	
Speech intelligibility (when specified, see 3.1)	3.6.3.13	4.8.4.13	
<u>Group IV</u>			
Fungus	3.6.3.6	4.8.4.6	3
Vibration	3.6.3.7	4.8.4.7	
Temperature	3.6.3.8	4.8.4.8	
Temperature shock	3.6.3.9	4.8.4.9	
Humidity	3.6.3.10	4.8.4.10	
Shock	3.6.3.11	4.8.4.11	
Salt fog	3.6.3.12	4.8.4.12	
Speech intelligibility (when specified, see 3.1)	3.6.3.13	4.8.4.13	
<u>Group V</u>			
(Switch)			3
Life	3.6.4.1	4.8.5.1	
Actuator force	3.6.4.2	4.8.5.2	
Contact resistance	3.6.4.5	4.8.5.3	
(Cable)			
Flexing life	3.6.5.1	4.8.5.4	
Isolation	3.6.5.2	4.8.5.5	

4.7 Conformance inspection.

4.7.1 Inspection of product for delivery. Inspection of product for delivery shall consist of groups A and B inspections.

4.7.1.1 Inspection lot. An inspection lot shall consist of all earphones and microphones of the same type produced under essentially the same conditions, and offered for inspection at one time.

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4.7.1.2 Group A inspection. Group A inspection shall consist of the inspection specified in [table VI](#).

4.7.1.2.1 Sampling plan. Accept on zero, for general inspection as specified in [table VII](#), group A.

TABLE VI. Group A inspection.

Inspection	Requirement paragraph	Test method paragraph
Visual and mechanical examination	3.1 , 3.3 , 3.4 , 3.5 , 3.7 and 3.8	4.8.1

TABLE VII. Sampling plan.

Lot size	Sample size	
	Group A	Group B
2 to 8	1/	2
9 to 13	1/	3
14 to 25	13	3
26 to 50	13	5
51 to 90	13	6
91 to 150	13	7
151 to 280	20	10
281 to 500	29	11
501 to 1200	34	15
1201 to 3200	42	18
3201 to 10,000	50	22
10,001 to 35,000	60	29

[1/](#) Indicates entire lot must be inspected. In no case will the sample size exceed the lot size.

4.7.1.2.2 Rejected lots. If one or more defects are found, the lot shall be rescreened and defects removed. After screening and removal of defects, a new sample of parts shall be randomly selected in accordance with [table VII](#), if one or more defects are found in the second sample, the lot shall be rejected and shall not be supplied to this specification.

4.7.1.3 Group B inspection. Group B inspection shall consist of the inspection specified in [table VIII](#) and shall be made on sample units which have been subjected to and have passed the group A inspection (For additional testing requirements see [3.1](#)).

TABLE VIII. Group B inspection.

Inspection	Requirement paragraph	Test method paragraph
Slide adjustment	3.6.3.3	4.8.4.3

4.7.1.3.1 Sampling plan. Accept on zero, for general inspection as specified in [table VII](#), group B. The sample size shall be based on the inspection lot size from which the sample was selected for group A inspection.

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4.7.1.3.2 Rejected lots. If one or more defects are found, the lot shall be rescreened and defects removed. After screening and removal of defects, a new sample of parts shall be randomly selected in accordance with [table VII](#), if one or more defects are found in the second sample, the lot shall be rejected and shall not be supplied to this specification.

4.7.1.3.3 Disposition of sample units. Sample units, which have passed the group B inspection, may be delivered on the contract or purchase order, if the lot is accepted and the sample units are still within specified electrical tolerances.

4.7.2 Periodic inspection. Periodic inspection shall consist of group C inspection. Except where the results of these inspections show noncompliance with the applicable requirements (see [4.7.2.1.4](#)), delivery of products which have passed groups A and B inspections shall not be delayed pending the results of these periodic inspections.

4.7.2.1 Group C inspection. Group C inspection shall consist of the inspections specified in [table IX](#), in the order shown. Group C inspection shall be made on sample units selected from inspection lots, which have passed the groups A, and B inspections (For additional testing requirements see [3.1](#)).

TABLE IX. Group C inspection.

Inspection	Requirement paragraph	Test method paragraph
Fungus	3.6.3.6	4.8.4.6
Vibration	3.6.3.7	4.8.4.7
Temperature	3.6.3.8	4.8.4.8
Temperature shock	3.6.3.9	4.8.4.9
Humidity	3.6.3.10	4.8.4.10
Shock	3.6.3.11	4.8.4.11
Salt fog	3.6.3.12	4.8.4.12
(Switch)		
Life	3.6.4.1	4.8.5.1
Actuator force	3.6.4.2	4.8.5.2
Contact resistance	3.6.4.5	4.8.5.3

4.7.2.1.1 Sampling plan. Four sample units shall be selected from each 2-months' production, or each 1,000 units, whichever occurs first, after date of notification of qualification.

4.7.2.1.2 Failures. If one or more sample units fail to pass group C inspection, the sample shall be considered to have failed. When an item selected from a production run fails to meet the specification, no items still on hand or later produced shall be accepted until the extent and cause of failure have been determined and appropriately corrected. The contractor shall explain to the Government representative the cause of failure and the action taken to preclude recurrence. After correction, all the tests shall be repeated.

4.7.2.1.3 Disposition of sample units. Sample units, which have been subjected to group C inspection, shall not be delivered on the contract or purchase order.

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4.7.2.1.4 Noncompliance. If a sample fails to pass group C inspection, the manufacturer shall notify the qualifying activity and the cognizant inspection activity of such failure and take corrective action on the materials or processes, or both, as warranted, and on all units of product which can be corrected and which were manufactured using essentially the same materials and processes, and which are considered subject to the same failure. Acceptance and shipment of the product shall be discontinued until corrective action, acceptable to the qualifying activity has been taken. After the corrective action has been taken, group C inspection shall be repeated on additional sample units (all inspections, or the inspection which the original sample failed, at the option of the qualifying activity). Groups A and B inspections may be reinstituted; however, final acceptance and shipment shall be withheld until the group C inspection has shown that the corrective action was successful. In the event of failure after reinspection, information concerning the failure shall be furnished to the cognizant inspection activity and the qualifying activity.

4.8 Methods of examination and test.

4.8.1 Visual and mechanical examination. Headsets shall be examined to verify that the materials, design, construction, physical dimensions, markings, and workmanship are in accordance with the applicable requirements (see 3.1, 3.3, 3.4, 3.5, 3.7, and 3.8).

4.8.2 Microphone examination and tests. The examination and tests of each type of microphone shall be performed in accordance with the specification or testing procedures specified for that type (see 3.1).

4.8.3 Earphone examination and tests. The examination and tests of each type of earphone or earphone element shall be performed in accordance with the specification or testing procedures specified for that type (see 3.1).

4.8.4 Examination and tests of headsets and headset-microphones.

4.8.4.1 Sound attenuation (see 3.6.3.1).

- a. Using a free field environment the subject shall be seated in a chair with a headrest at a fixed distance from a loudspeaker in order to minimize the undesirable effects of standing waves. All subjective tests shall be conducted with the subject's head against the headrest. Subjects shall be instructed not to raise their arms during the pure tone presentations so as not to change their sound diffraction patterns.
- b. Prior to running the subjective tests, it is necessary to calibrate the sound pressure in the test room. A WEC0 640AA condenser microphone or a demonstrated equivalent shall be used in the sound field to calibrate the sound pressure level of the white noise at each test frequency. The calibrating microphone may be used throughout the attenuation test for direct reading of the sound pressure level at each test frequency.
- c. The subject shall be seated as stated in step a. and, without the headset on, shall adjust the pressure level of the pure tone sound until it is just audible and the level is recorded. Then the subject shall don the headset and assure that the earcups are properly fitted over the ears to make a good seal. The subject shall readjust the pressure level of ears to make a good seal. The subject shall readjust the pressure level of the tone until the sound is again just audible. The change in level of the sound in decibels is the attenuation provided by the earcups of the headset.
- d. Step C shall be carried out twice at each of 12 different frequencies in the audio spectrum: 100, 250, 500, 750, 1000, 1500, 2000, 2500, 3000, 4000, 5000, and 6000 Hz. The test frequencies need not be used in the order listed.
- e. Step C shall be repeated with a minimum of five subjects. Their ages shall be between 20 and 40 years and they shall have no hearing deficiency. At each test frequency the electrical attenuation required to make the two tones sound equally loud shall be averaged for all of the subjects. These arithmetical means shall be plotted as shown on figure 15. The electrical attenuation is equal to the acoustical attenuation or sound insulation of the headset.

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4.8.4.2.1 Headset. A microphone M-87/AIC shall be connected to the microphone jack of the headset cable. The main cable connector on the headset shall be inserted into a mating connector, which has the earphone contacts connected to the output of an amplifier of suitable gain and the microphone contacts to the input of the same amplifier. During this test, the talker shall listen to his own voice while speaking into the microphone to insure that the headset is functioning satisfactorily.

4.8.4.2.2 Headset-microphone. The test specified in 4.8.4.1 shall be performed except the microphone normally used on the headset-microphone shall be used.

4.8.4.3 Slide adjustment (see 3.6.3.3). The headset shall be clamped in a secure position and in such a manner to allow the rods of the receiver holder to move freely. The rods shall be placed in the compressed position, thumbnut tightened and the force required to move the rod to the extended position shall be measured. The force required to return the rod to the compressed position shall be measured. A spring scale with a hook or any other suitable method that is agreeable with the contracting officer may be used to measure the force. (If the thumbnut is used then the measured force is not required.)

4.8.4.4 Strain relief (see 3.6.3.4). The cord conductors shall be detached from the plug. The jacket of the cord or cable assembly shall be suitably marked adjacent to the end of the plug or clamp and its position relative to the end of the plug noted. The plug shall be securely held or clamped, and a force shall be applied to the cord in a direction tending to withdraw the cord from the plug. The force shall be increased gradually to 12 pounds and held at that value for 10 seconds. A change in position of the jacket marking relative to the end of the plug shall be considered as evidence of slippage of the cord or cable assembly out of the plug.

4.8.4.5 Random drop (see 3.6.3.5). The entire headset shall be cooled to a temperature of -40 degrees F and dropped a total of 12 times on a concrete floor a distance of 6 feet above the floor. At the discretion of the contractor, the floor may be covered with one layer of floor tile. The headset shall be dropped at least one time in each of three planes. Upon completion of the test, the talk test in accordance with 4.8.4.2 and visual and mechanical examination in accordance with 4.8.1 shall be performed.

4.8.4.6 Fungus (see 3.6.3.6). Fungus-inert materials listed in group I of table X are preferred for use. These materials need not be tested for fungus resistance prior to use. The appearance of a particular material in table X does not constitute approval for its use except from the viewpoint of the resistance of the material to fungi. At the option of the contractor, the contractor can refer to fungus resistant materials, or test method 510 of MIL-STD-810 shall be performed. Upon completion of the test the surface shall be examined for flaking and peeling. The talk test shall be performed.

4.8.4.7 Vibration (see 3.6.3.7). The headset or headset-microphone shall be tested in accordance with test method 201 of MIL-STD-202. Upon completion of the test the talk test in accordance with 4.8.4.2 and the visual and mechanical examination in accordance with 4.8.1 shall be performed.

4.8.4.8 Temperature (see 3.6.3.8). The headset or headset-microphone shall be tested in accordance with MIL-STD-810, method 501.1, procedure 1 with a storage temperature of -55 degrees C and an operating temperature of -40 degrees C and MIL-STD-810, method 502.1, procedure 1 with a storage temperature of 70 degrees C and an operating temperature of 65 degrees C. Upon completion of the test the talk test in accordance with 4.8.4.2 and the visual and mechanical examination in accordance with 4.8.1 shall be performed.

4.8.4.9 Temperature shock (see 3.6.3.9). The headset or headset-microphone shall be tested in accordance with method 503 of MIL-STD-810. Upon completion of the test the talk test in accordance with 4.8.4.2 and the visual and mechanical examination in accordance with 4.8.1 shall be performed.

4.8.4.10 Humidity (see 3.6.3.10). The headset or headset-microphone shall be tested in accordance with method 103 of MIL-STD-202, test condition B. Upon completion of the talk test in accordance with 4.8.4.2 and the visual and mechanical examination in accordance with 4.8.1 shall be performed.

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4.8.4.11 Shock (see 3.6.3.11). The headset or headset-microphone shall be tested in accordance with test method 213 of MIL-STD-202, test condition A. Upon completion of the test the talk test in accordance with 4.8.4.2 and the visual and mechanical examination in accordance with 4.8.1 shall be performed.

TABLE X. Fungus materials.

<u>Group I – Fungus-inert materials</u> (Fungus-inert in all modified states and grades)	
Acrylics Acrylonitrile-styrene Acrylonitrile-vinyl-chloride copolymer Asbestos Ceramics Chlorinated polyester Fluorinated ethylene-propylene copolymer (FEP) Glass Metals Mica Plastic laminates: Silicone-glass fiber Phenolic-nylon fiber Diallyl phthalate Polyacrylonitrile	Polyamide <u>1/</u> Polycarbonate Polyester-glass fiber laminates Polyethylene, high density (above 0.940) Polyethylene terephthalate Polyimide Polymonochlorotrifluoroethylene Polypropylene Polystyrene Polysulfone Polytetrafluoroethylene Polyvinylidene chloride Silicone resin Siloxane-polyolefin polymer Siloxane polystyrene
<u>Group II – Fungus nutrient materials</u> (May require treatment to attain fungus resistance)	
ABS (Acrylonitrile-butadiene-styrene) Acetal resins Cellulose acetate Cellulose acetate butyrate Epoxy-glass fiber laminates Epoxy-resin Lubricants Melamine-formaldehyde Organic polysulphides Phenol-formaldehyde Polydichlorostyrene	Polyethylene, low and medium density (0.940 and below) Polymethyl methacrylate Polyurethane (the ester types are particularly susceptible) Polyricinoleates Polyvinyl chloride Polyvinyl chloride-acetate Polyvinyl fluoride Rubbers, natural and synthetic Urea-formaldehyde

1/ Literature shows that under certain conditions polyamides may be attacked by selective micro-organisms. However, for military applications, they are considered group I.

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4.8.4.12 Salt fog (see 3.6.3.12). The headset or headset-microphone shall be tested in accordance with test method 101, salt atmosphere, of MIL-STD-202, test condition B. Upon completion of the test the talk test in accordance with 4.8.4.2 and the visual and mechanical examination in accordance with 4.8.1 shall be performed.

4.8.4.13 Speech intelligibility (see 3.6.3.13). The headset microphone shall be tested in accordance with ANSI S3.5.

4.8.5 Switch. When a switch is specified, it shall be tested as follows:

4.8.5.1 Life (see 3.6.4.1). The switch, mounted in its housing and not connected to the cords of the headset-microphone assembly, shall be subjected to 200,000 continual operations at a rate of 40 to 60 complete operations per minute and number of operations monitored by a mechanical counter. A 24-volt dc source with a series resistor adjusted for a current flow of 1/2 ampere shall flow through the switch control circuit contacts and the number of operations monitored by an electrical counter. A 3-volt dc source with a series resistor adjusted for a current flow of 85 milliamperes shall flow through the switch operational (voice) circuit contacts and the number of operations monitored by an electrical counter. Any number of switches may be tested at the same time on the same test fixture. Each switch shall have its own electrical counter, or all the control circuit terminals shall be connected in series to one electrical counter, and all the operational (voice) circuit terminals shall be connected in series to one electrical counter. The switch contacts shall make in the following sequence: Position 1 - Monitor Telephone or Radio; Position 2 - Telephone Hold-On; Position 3 - Telephone Lock-On (not during life test); and Position 4 - Radio Hold-On; and break in the reverse order. The electrical counts shall correspond to the mechanical count or the test is considered a failure. The contact sequence shall be the same after the test (4 positions including lock-on) or the test is considered a failure. The switch mounted in the normal operating configuration in the switch housing before life test shall meet the requirements of 3.6.4.2 and 3.6.4.3, and after life test shall not exceed 20 percent degradation of 3.6.4.2 and 3.6.4.3 and shall meet the requirements of 3.6.4.1.

4.8.5.2 Actuator force (see 3.6.4.2). The switch mounted in its normal operating configuration in the handset shall be subjected to a force necessary to close positions 1 and 3 and to hold circuits closed.

4.8.5.3 Contact resistance (see 3.6.4.5). The switch contact resistance shall be measured by means of an electronic volt-ohmmeter, which is capable of measuring 0.05 ohm with no more than 5 percent error, and shall meet the requirements of 3.6.4.3.

4.8.5.4 Flexing life (cable) (see 3.6.5.1). Three samples of the multiconductor (main headset/microphone cable) unterminated cable shall be clamped and suspended through holes in a metal bar having a cross section of .500 inch by .625 inch as described below:

- a. The clamping point shall be immediately above the metal bar; the cable clamp shall rest on the top of the metal bar.
- b. The cable shall be clamped in such a manner that it will not turn in the hole during the flexing test.
- c. The length of the through holes in the metal bar shall be .625 inch. The diameter of the through holes shall be .0005 to .0100 inch (0.01 mm to 0.25 mm) greater than the diameter of the cable, which is undergoing test.
- d. The through holes in the metal bar shall incorporate a .125-inch radius at the end from which the cable emerges (bending point).
- e. A knot shall be tied near the free end of the cable and a 1-pound weight shall be hung from the knot to maintain the cable in a vertical position.
- f. The individual conductors of each sample cable, a small low current drain 6-volt lamp, and a suitable power source shall be connected in series to indicate electrical continuity. The metal bar, supported horizontally, shall then be rotated about its longitudinal axis back and forth through an angle of 120 degrees (60 degrees each side of vertical) at a rate of approximately 85 Hz. The arithmetical mean of the flexing cycles of the three samples of the cable before electrical discontinuity occurs shall be taken as the flexing of the cable.

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4.8.5.5 Isolation (cable) (see 3.6.5.2). The cable shall be tested in accordance with figure 17.

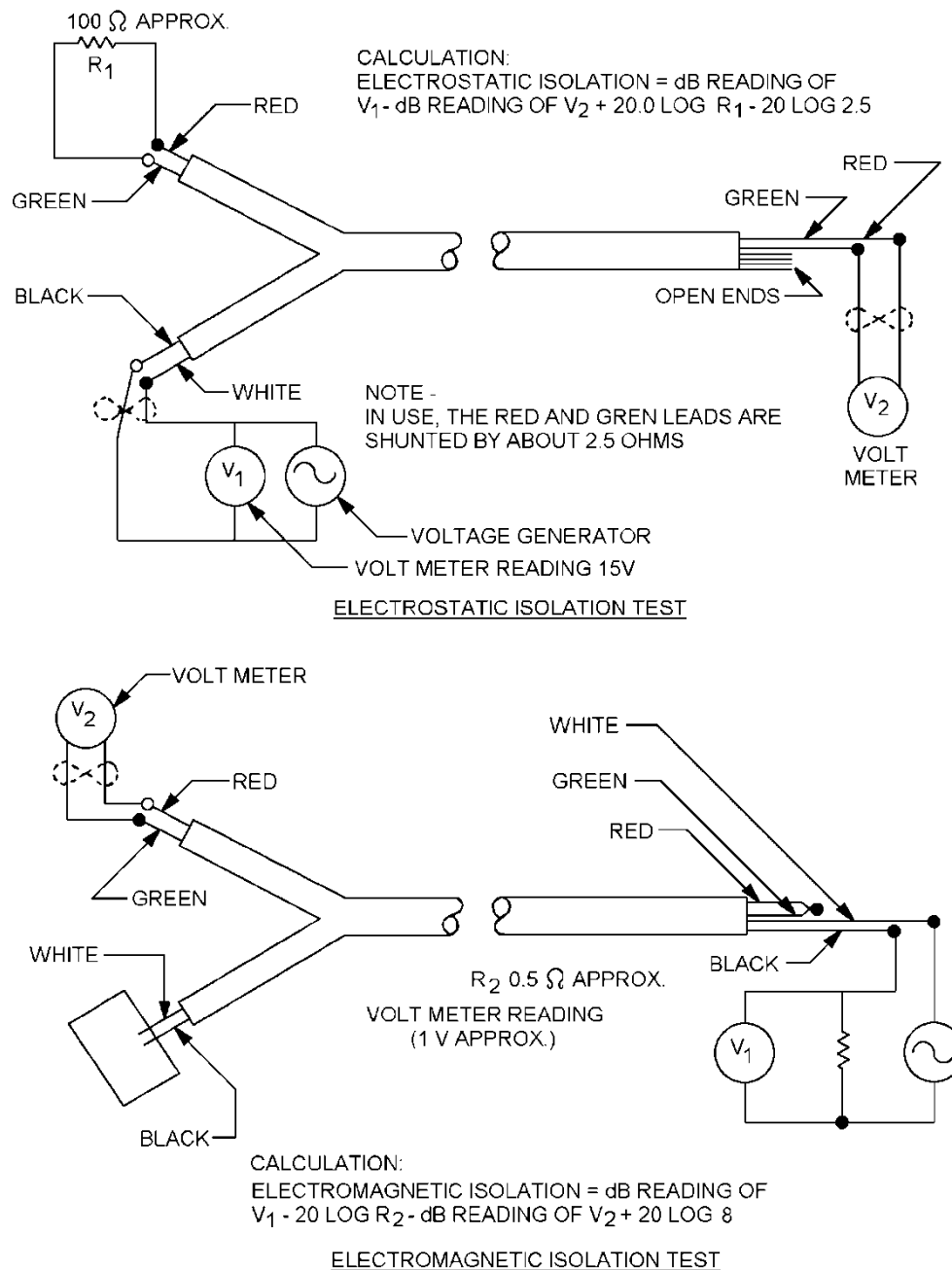


FIGURE 17. Electrostatic and electromagnetic isolation test.

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5. PACKAGING

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When packaging of materiel is to be performed by DoD or in-house contractor personnel, these personnel need to contact the responsible packaging activity to ascertain packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activities within the Military Service or Defense Agency, or within the military service's system commands. Packaging data retrieval is available from the managing Military Department's or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity.

6. NOTES

(This section contains information of a general or explanatory nature, which may be helpful but is not mandatory.)

6.1 Intended use. The headsets and headset-microphones are ruggedized and unique to military and used on various military communication systems throughout aircraft, ship and ground weapon systems.

6.2 Acquisition requirements. Procurement documents should specify the following:

- a. Title, number, and date of this specification.
- b. Issue of DoDISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.2).
- c. Packaging requirements (see 5.1).

6.3 Qualification (see 3.2). With respect to products requiring qualification, awards will be made only for products which are, at the time of award of contract, qualified for inclusion in the applicable Qualified Products List QPL-83511, whether or not such products have actually been so listed by that date. The attention of the contractors is called to these requirements, and manufacturers are urged to arrange to have the products that they propose to offer to the Federal Government tested for qualification in order that they may be eligible to be awarded contracts or orders for the products covered by this specification. Information pertaining to qualification of products may be obtained from the DLA Land and Maritime (Attn: VQP), 3990 East Broad Street, Columbus, Ohio 43218-3990 or vqp.do@dla.mil. An online listing of products qualified to this specification may be found in the Qualified Products Database (QPD) at <https://assist.dla.mil>.

6.4 Anechoic room or chamber (free field room or environment). An Anechoic or free field environment is a room or area whose boundaries absorb effectively all the sound incident thereon, thereby affording essentially free field conditions.

6.5 Environmentally preferable material. Environmentally preferable materials should be used to the maximum extent possible to meet the requirements of this specification. As of the dating of this document, the U.S. Environmental Protection Agency (EPA) is focusing efforts on reducing 31 priority chemicals. The list of chemicals and additional information is available on their website <http://www.epa.gov/osw/hazard/wastemin/priority.htm>. Included in the EPA list of 31 priority chemicals are cadmium, lead, and mercury. Use of these materials should be minimized or eliminated unless needed to meet the requirements specified herein (see 3.4).

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w/AMENDMENT 16.6 Subject term (key word) listing.

Acrylonitrile-Butadiene-Styrene (ABS)
 Boom assembly
 Clothes clip
 Cushion
 Earcup
 Earphone
 Filler
 Headband
 Jacks, telephone
 Plugs, telephone
 Solder
 Switch

6.7 Test equipment and inspection facilities (see 4.1). Information on the establishment and maintenance of a calibration system to control the accuracy of the measuring and test equipment can be found in NCSL Z540.1 HDBK, titled: "Handbook for the Interpretation and Application of ANSI/NCSL Z540-1-1994".

(Copies of this document are available online at <http://www.ncsli.org> or from NCSL International, 2995 Wilderness Place, Suite 107 Boulder, Colorado 80301-5404.)

6.8 Tin whisker growth (see 3.4.4). The use of alloys with tin content greater than 97 percent, by mass, may exhibit tin whisker growth problems after manufacture. Tin whiskers may occur anytime from a day to years after manufacture and can develop under typical operating conditions, on products that use such materials. Conformal coatings applied over top of a whisker-prone surface will not prevent the formation of tin whiskers. Alloys of 3 percent lead, by mass, have shown to inhibit the growth of tin whiskers. For additional information on this matter, refer to ASTM B545 (Standard Specification for Electrodeposited Coatings of Tin).

6.9 Amendment notations. The margins of this specification are marked with vertical lines to indicate modifications generated by this amendment. This was done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content, irrespective of the marginal notations.

CONCLUDING MATERIAL

Custodians:
 Army - CR
 Navy - EC
 Air Force - 85
 DLA - CC

Preparing activity:
 DLA - CC

(Project 5965-2012-015)

NOTE: The activities listed above were interested in this document as of the date of this document. Since organizations and responsibilities can change, you should verify the currency of the information above using the ASSIST Online database at <https://assist.dla.mil>.