

PERFORMANCE SPECIFICATION SHEET

MICROPHONE ASSEMBLY, M-169A/AIC

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

The requirements for acquiring the product described herein shall consist of this specification and MIL-PRF-26542.

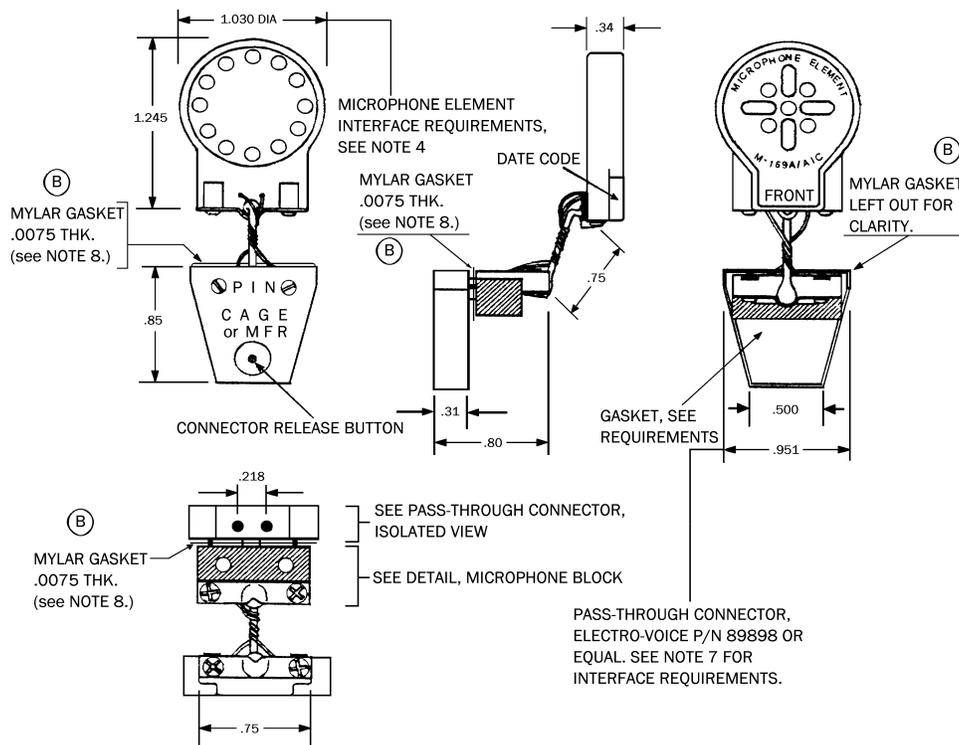
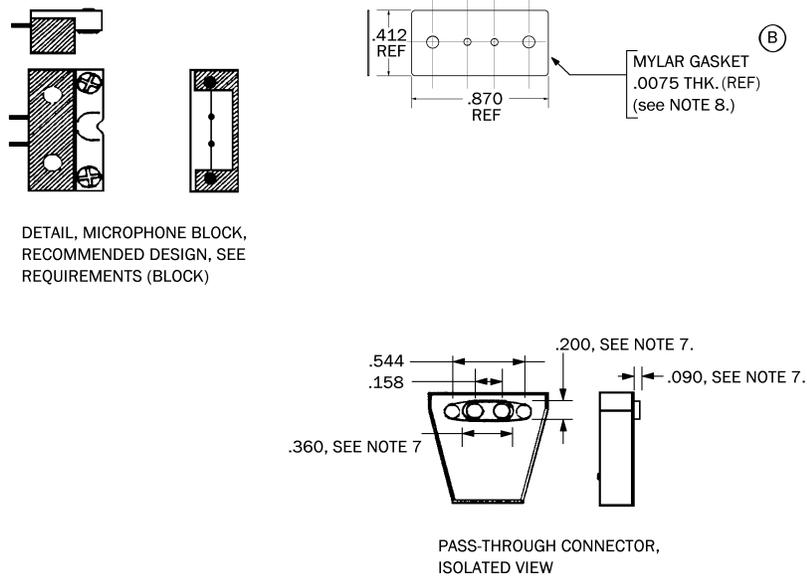


FIGURE 1. Microphone assembly M-169A/AIC

(B) Denotes changes.

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NOTES:

1. Dimensions are in inches. Tolerance is $\pm .015$ inches, unless otherwise specified.
2. Quantity and configuration of sound ports is optional.
3. Location of marking on sides shown is optional.
4. Dimensions of microphone element shall provide interface to the dimensions of the interior space in the mask facepiece, allowing the element to position closely to the user's mouth without becoming obstructed by other mask components, such as valve terminals.
5. Dimensions of microphone block shall provide interface to the pass-through holes of the mask facepiece, as well as to the exterior bracket, and shall ensure a leak-proof seal.
6. All non-dimensioned contours and illustration components shall be designed to meet the performance requirements of this specification and MIL-PRF-26542.
7. Dimensions of the pass-through connector shall provide interface to electrical connectors, shall provide a leak proof seal at the microphone pin openings, and shall allow a firm seating of the microphone block against the interior of the mask facepiece when installed (For the correct torque to use refer to the correct T.O. for the specific Oxygen Mask). The pass-through connector dimension 0.090 (with the 0.031(ref) rubber gasket, Electro-Voice Part Number 38726 or equivalent) is intended for interface to the corresponding reduced thickness region of the MBU-20/P (rubber) facepiece, as well as to the depth of the MBU-12 hardshell opening, to provide a firm seal and secure electrical connection.
8. The microphone block shall be supplied with a Mylar gasket, as shown in figure 1, Electro-Voice Part Number 38872 or equivalent. The Mylar gasket must be thin enough to allow a secure electrical connection of the block to the pass-through connector, in addition, it must be a durable material capable of withstanding use for at least 30 days (1 cleaning cycle), and meet the unsafe Materials requirement (see below).

FIGURE 1. Microphone assembly M-169A/AIC - Continued.

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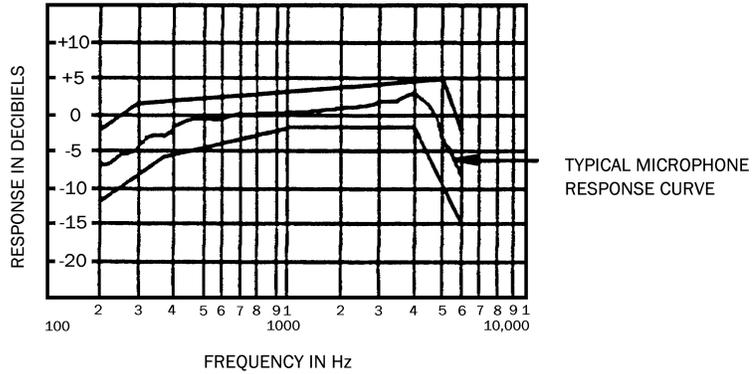


FIGURE 2. Frequency response at sea level.

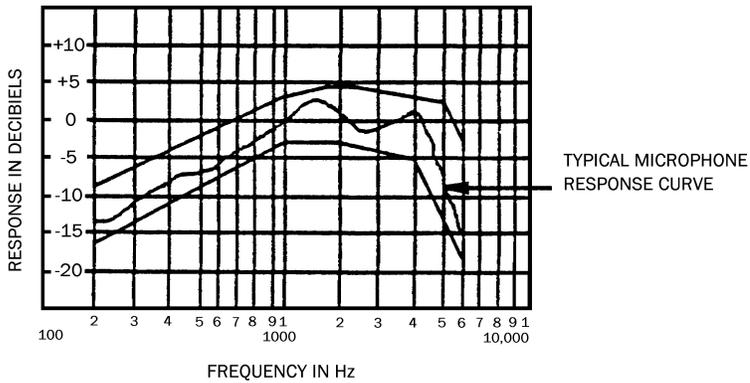


FIGURE 3. Frequency response at 25,000 feet.

REQUIREMENTS:

Component parts: Shall be in accordance with figure 1.

Release button: Shall be recessed to prevent obstruction and inadvertent release of connector.

Bracket rod: Shall be bent to $90^\circ \pm 2^\circ$ (degrees) at the microphone-element end, as shown in figure 1, to provide a complete adjustable range of the element when installed in the oxygen mask. The rod shall be built from a high-strength, corrosion-resistant material meeting the requirements of MIL-PRF-26542, such as stainless steel.

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Microphone block:

Screw-receiving sections. The material which receives the mask installation screws (see figure 1, "detail, microphone bracket", shaded portions) shall prevent breakage and screw slippage, having a single metal section enclosing and connecting the two screw-receiving sections. The metal shall be either nickel-plated brass, or another material with equivalent or superior strength, corrosion-resistance, and adherence to the requirements of MIL-PRF-26542. The design shown in figure 1 (detail, microphone block) shall be used, or a design which meets or exceeds its performance without introducing mask damage or other hazards to the user, upon approval from the qualifying activity.

Interface to oxygen-mask material. The bracket shall be designed to prevent damage to the oxygen mask material, to which it is secured in use. This shall include damage resulting both from: (a) torque stresses on the element resulting from pilot imposed forces such as adjustments to the microphone element orientation, or pull forces from associated cable and hose assemblies during normal head motion, and (b) possible compression of the mask facepiece due either to altitude pressure changes, or intentional squeezing of the nose section as a result of the periodic need to clear sinus cavities during use.

* Pass-through connector:

The connector shall include two gaskets; (1) A 0.031(ref) thick gasket, Electro-Voice P/N 3872 or equivalent (see figure 1 and note 7), covering the mask interface surface, which provides an airtight, slip resistant seal, such as silicon rubber, meeting the performance requirements of MIL-PRF-26542. (2) A Mylar gasket, Electro-Voice P/N 38872 or equivalent (see figure 1 and note 8), to be used between the internal surface of the mask and the microphone block to prevent cutting from the block edge.

Unsafe materials: Parts and adhesives, which install inside the mask, and which may become detached during normal use and thus create an ingestion hazard, or which otherwise present a chemically toxic hazard to the user, shall not be used.

* Hardware: The product shall be supplied with 2 stainless steel screws for securing the pass through connector to the microphone block. The screws shall be type 2-56 UNC X ½ fillister head, slotted, for interchangeability of spares.

Color: In accordance with MIL-PRF-26542, with the exception that metal components shall not have surface coloring, but shall retain their natural appearance.

Weight: 22 grams, maximum.

Performance:

Sensitivity at ground level: 34.96 dB – 40.98 dB (re 1 μ V) or 55.97 μ V – 111.94 μ V with an SPL input of 28 dynes/cm² at 1 kHz.

Sensitivity at altitude: At a simulated altitude of 25,000 feet, the sensitivity shall be equal or not more than 8 dB of the ground level sensitivity.

Frequency response: The frequency response at ground level shall be within the limits shown (fig. 2), and the frequency response at 25,000 feet shall be within the limits shown (figure 3). The frequency response range shall be 200-6,000 Hz.

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Impedance: 4.0 ohms to 6.0 ohms. The impedance at any frequency over the range of 200 Hz to 6,000 Hz shall not deviate from the 1,000 Hz impedance by more than 20 percent.

Resistive load: 5.0 ohms.

Dielectric withstanding voltage:
This test may be performed on the bracket in isolation from the microphone element, at the option of the manufacturer.

Microphone leakage: There shall be no more than 100 ml/min of leakage, and the test shall only be performed at 60,000 feet simulated altitude. This test shall be performed at a laboratory acceptable to the Qualifying Activity.

Intended use. The M-169A/AIC is a dynamic, noise-canceling moving coil microphone designed for use in an oxygen mask or pressure type oxygen helmet, at altitudes where the use of an oxygen helmet is required. The microphone element is intended for use with intercommunication sets AN/AIC-10() and AN/AIC-18. The microphone is used with both the MBU-12 and MBU-20/P (Combat Edge) oxygen masks.

The microphone assembly shall be tested in accordance with the tests listed in table II.

TABLE 1. Part number designations.

Part or Identifying Number (PIN)	Characteristics
M-169A/AIC	Microphone assembly as shown in figure 1 above.
M26542/12-01	Pass-through connector, alone.

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TABLE II. Parameter applicability.

Inspection	Requirements paragraph	Test paragraph	Qualification tests	Group "A" tests	Group "B" tests	Group "C" tests
<u>Group I</u>						
Visual and mechanical inspection	3.1, 3.4, 3.5	4.5.1	X	X		
Sensitivity at ground level	3.5.1	4.5.2.2	X	X		
Sensitivity at altitude	3.5.2	4.5.2.3	X			
Frequency response at ground level	3.5.3	4.5.2.4	X	X		
Frequency response at altitude	3.5.4	4.5.2.5	X			
Impedance	3.5.5	4.5.3	X	X		
Noise cancellation characteristics	3.5.7.1	4.5.5.1	X			
Effect of external magnetic field	3.5.8	4.5.6	X			
Stray magnetic field	3.5.9	4.5.7	X			
Linearity	3.5.10	4.5.8	X			
Talk-out	3.5.11	4.5.9	X	X		
Dielectric withstanding voltage	3.5.12	4.5.10	X			
Signal-to-noise	3.5.7	4.5.5	X		X	
Distortion	3.5.6	4.5.4	X		X	
Interchangeability	3.5.13	4.5.11	X		X	
<u>Group II</u>						
Thermal shock	3.5.14	4.5.12	X			X
Humidity	3.5.15	4.5.13	X			X
Drop	3.5.16	4.5.14	X			X
Pressure equalization	3.5.17	4.5.15	X			X
Explosive decompression	3.5.18	4.5.16	X			X
Salt fog	3.5.19	4.5.17	X			X
<u>Group III</u>						
Vibration	3.5.20	4.5.18	X			X
Bounce	3.5.21	4.5.19	X			X
Altitude	3.5.22	4.5.20	X			X
Moisture barrier seal	3.5.23	4.5.21	N/A			N/A
Immersion	3.5.24	4.5.22	N/A			N/A
<u>Group IV</u>						
Fungus	3.5.25	4.5.23	X			
<u>Group V</u>						
Gun blast	3.5.26	4.5.24	N/A			
Microphone leakage	3.5.27	4.5.25	X			

Changes from previous issue: The margins of this specification are marked with an asterisk to indicate where changes from the previous amendment were made. 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 and relationship to the last previous amendment.

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Custodian:

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

Preparing activity:

DLA - CC

(Project 5965-0284)

Review activities:

Army - AR, AT, AV, CR4
Navy - AS, OS
Air Force - 99