INCH-POUND
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SUPERSEDING
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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 sheet and MIL-PRF-26542.

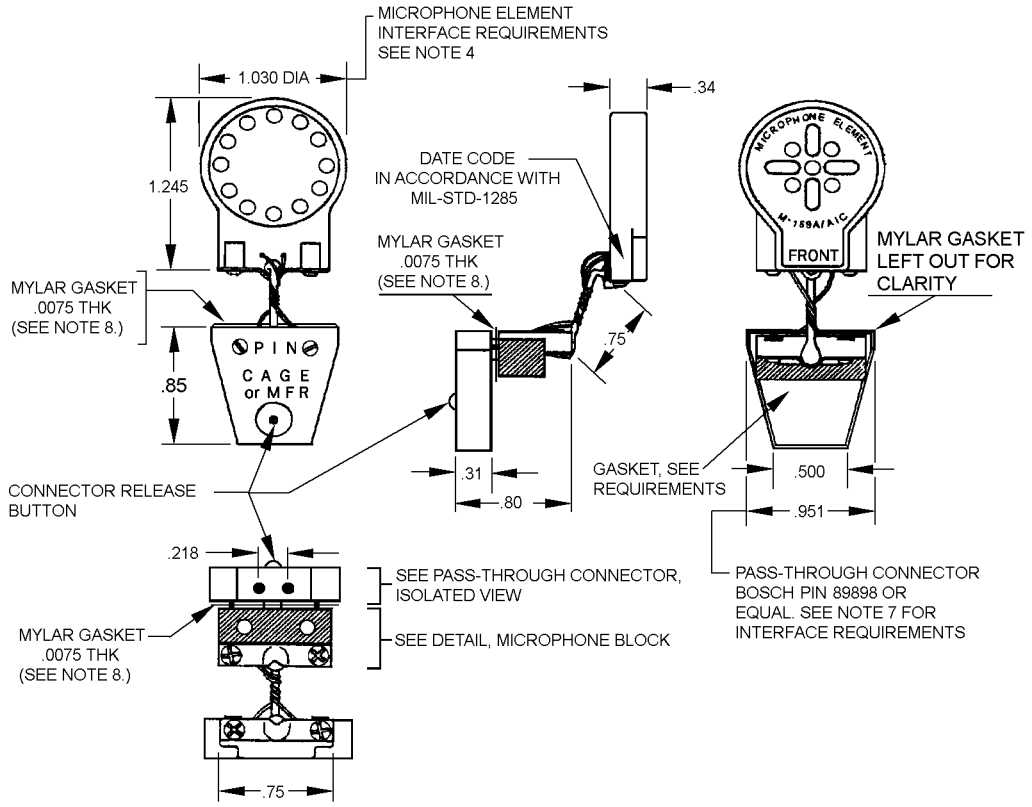
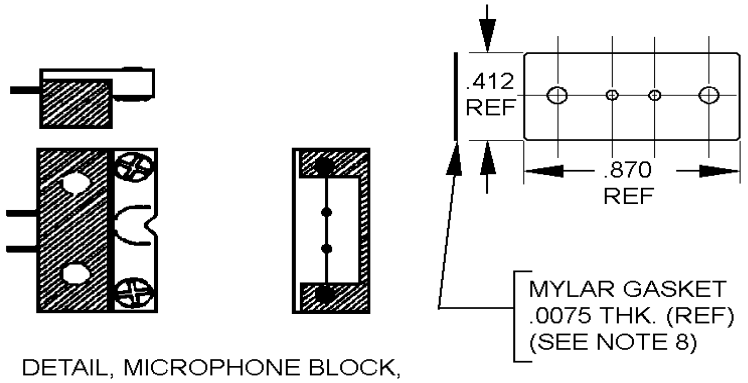
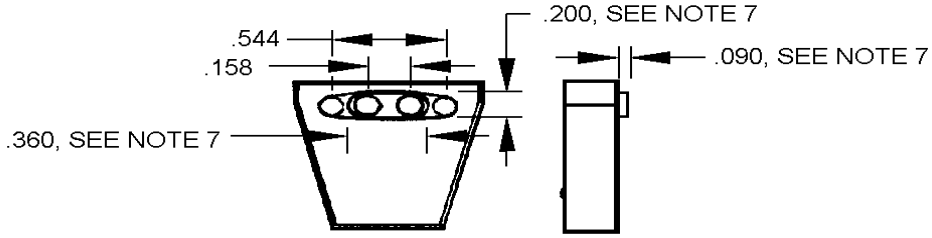


FIGURE 1. Microphone assembly M-169A/AIC.



DETAIL, MICROPHONE BLOCK, RECOMMENDED DESIGN, SEE REQUIREMENTS (BLOCK)

Inches	mm
.0075	0.19
.090	2.29
.158	4.01
.200	5.08
.218	5.54
.310	7.87
.340	8.64
.360	9.14
.412	10.46
.500	12.70
.544	13.82
.750	19.05
.800	20.32
.850	21.59
.870	22.10
.951	24.16
1.030	26.16
1.245	31.62

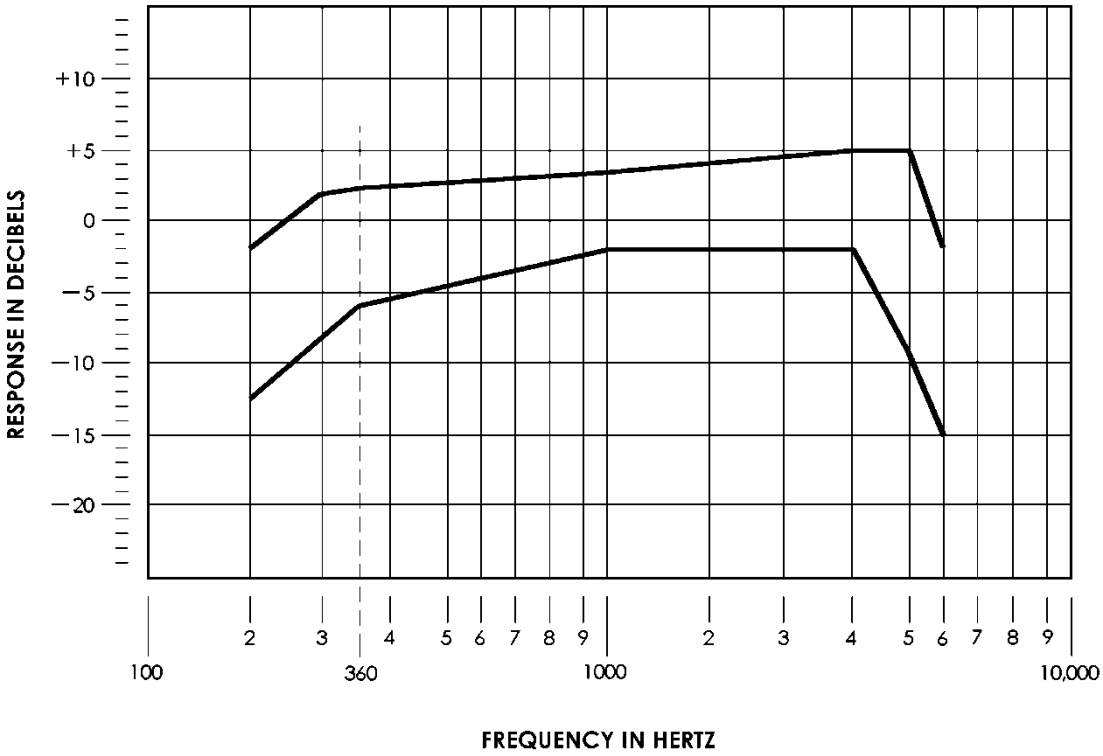


PASS-THROUGH CONNECTOR, ISOLATED VIEW

NOTES:

1. Dimensions are in inches. Tolerance is ± .015 inches, unless otherwise specified.
2. Quantity and configuration of sound ports is optional.
3. Location of marking on side shown is optional.
4. Dimensions of microphone element shall provide interface to the dimensions of the interior space in the mask face piece, 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 face piece, 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 sheet 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, "Bosch Security Systems Inc." Part or Identifying Number (PIN) 38726 or equivalent is intended for interface to the corresponding reduced thickness region of the MBU-20P (rubber) face piece, 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, "Bosch Security Systems Inc." PIN 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).
9. Metric equivalents are given for general information only and are based upon 1 inch = 25.4 mm.

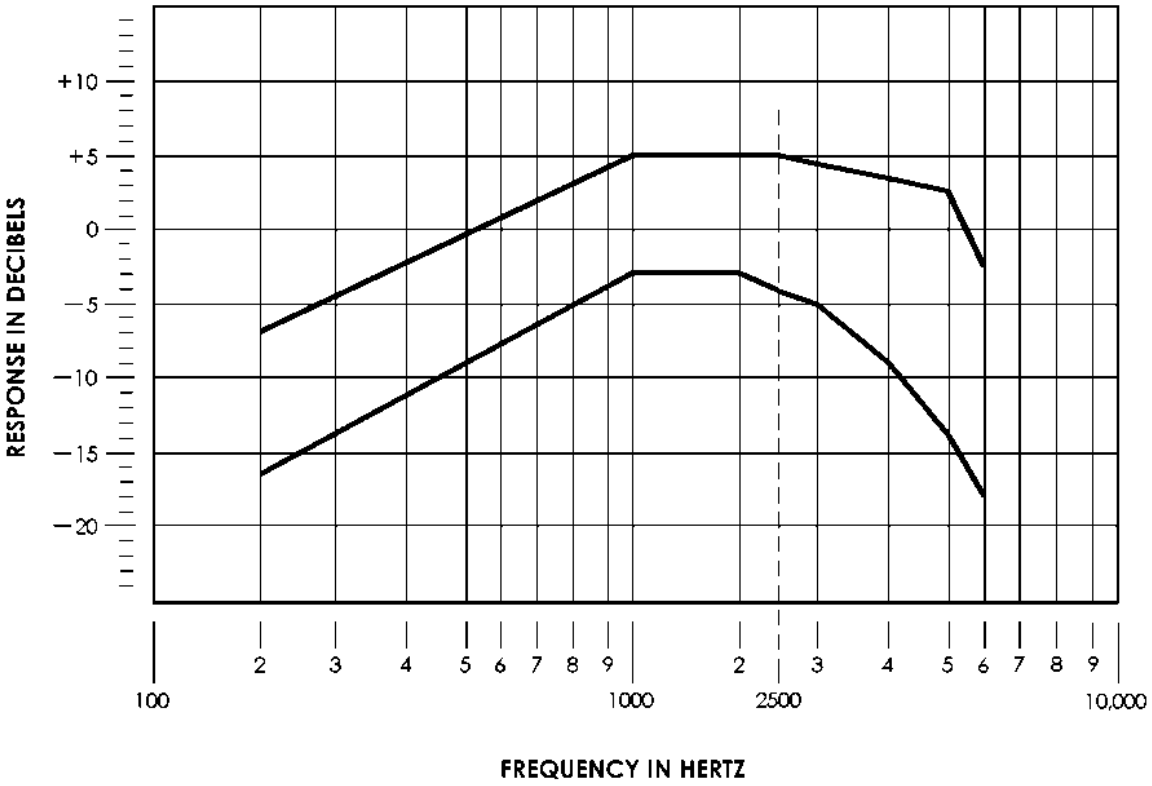
FIGURE 1. Microphone assembly M-169A/AIC – Continued.



Frequency points (Hz)	200	300	360	1,000	4,000	5,000	6,000
Upper limits (dB)	-2.0	2.0	(2.21) 1/	(3.40) 1/	5.0	5.0	-2.0
Lowerlimits (dB)	-12.5	(-8.01) 1/	-6.0	-2.0	-2.0	(-9.17) 1/	-15.0

1/ dB limits between key break point are calculated.

FIGURE 2. Frequency response at sea level.



Frequency points (Hz)	200	1,000	2,000	2,500	3,000	4,000	5,000	6,000
Upper limits (dB)	-7.0	5.0	5.0	5.0	(4.34) 1/	(3.31) 1/	2.50	-2.50
Lower limits(dB)	-16.50	-3.0	-3.0	(-4.10) 1/	-5.0	-9.0	(-13.96) 1/	-18.0

1/ dB limits between key break point are calculated.

FIGURE 3. Frequency response envelope 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 ± 2 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.

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, "Bosch Security Systems Inc." PIN 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, "Bosch Security Systems Inc." PIN 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 one half inch (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: Twenty two (22) grams, maximum.

Performance:

Sensitivity at ground level: 34.96 dB – 40.98 dB (re 1 µV) or 55.97 µV – 111.94 µV with an SPL input of 2.8 Pascal's (28 dynes/cm^2) 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 on figure 2. The frequency response at 25,000 feet shall be within the limits shown on figure 3. The frequency response range shall be 200-6,000 Hz. The response curves generated shall be on the same scale as shown in figures 2 and 3. The response curve shall not exceed the upper and lower limit curves of the stationary Frequency Response Envelope, within the frequency ranges identified in the appropriate chart (see figures 2 and 3).

Impedance: Four (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 bracket leakage: There shall be no more than 100 milliliters/minute 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: Microphone element M-169A/AIC is a noise canceling dynamic moving coil microphone element 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 both the MBU-12 and MBU-20/P (Combat Edge) oxygen masks, to provide communication under the noise conditions encountered in military aircraft.

The microphone assembly shall be identified as shown in table I and tested in accordance with the tests listed in table II.

TABLE I. Part or Identifying Number (PIN) designations.

PIN	Characteristics
M-169A/AIC	Microphone assembly, as shown in figure 1.
M26542/12-01	Pass-through connector, alone.

TABLE II. Parameter applicability.

Inspection	Qualification tests	Group "A" tests	Group "B" tests	Group "C" tests
Group I				
Visual and mechanical inspection	X	X		
Sensitivity at ground level	X	X		
Sensitivity at altitude	X			
Frequency response at ground level	X	X		
Frequency response at altitude	X			
Impedance	X	X		
Noise cancellation characteristics	X			
Effect of external magnetic field	X			
Stray magnetic field	X			
Linearity	X			
Talk-out	X	X		
Dielectric withstanding voltage	X			
Signal-to-noise	X		X	
Distortion	X		X	
Interchangeability	X		X	
Group II				
Thermal shock	X			X
Humidity	X			X
Drop	X			X
Pressure equalization	X			X
Explosive decompression	X			X
Salt fog	X			X
Group III				
Vibration	X			X
Bounce	X			X
Altitude	X			X
Moisture barrier seal	N/A			N/A
Immersion	N/A			N/A
Group IV				
Fungus	X			
Group V				
Gun blast	N/A			
Microphone bracket leakage	X			

Changes from previous issue. The margins of this specification sheet are marked with vertical lines to indicate where changes from the previous issue 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 upon the entire content, regardless of the marginal notations and relationship to the last previous issue.

Referenced documents. In addition to MIL-PRF-26542, this document references the following:

MIL-STD-1285

CONCLUDING MATERIAL

Custodian:
Army – CR
Navy – EC
Air Force – 85
DLA – CC

Preparing activity:
DLA – CC

(Project 5965-2012-013)

Review activities:
Army – AT, AV, CR4
Navy – AS, OS
Air Force – 99

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.