INCH-POUND

MIL-PRF-85726B(AS)
15 July 1998
SUPERSEDING
MIL-E-85726A(AS)
29 October 1991

PERFORMANCE SPECIFICATION

ENCLOSURE, STANDARD AVIONICS, FORCED AIR-COOLED, SPECIFICATION FOR

This specification is approved for use by the Naval Air Systems Command, Department of the Navy, and is available for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification covers forced air-cooled standard avionics enclosures, hereinafter referred to as enclosures. The enclosures accommodate Standard Electronic Modules (SEMs) Format B Span 2, Format C, and Format E, and a standard backplane.

2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3 and 4 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 documents cited in sections 3 and 4 of this specification, whether or not they are listed.

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commander, Naval Air Warfare Center Aircraft Division, Code 414100B120-3, Highway 547, Lakehurst, NJ 08733-5100 by using the Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A FSC 5975

DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.

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 listed in the issue of the Department of Defense Index of Specifications and Standards (DoDISS) and supplement thereto, cited in the solicitation (see 6.2).

SPECIFICATIONS

DEPARTMENT OF DEFENSE

MIL-M-7793	-	Meter, Time Totalizing.
MIL-M-16034	-	Meters, Electrical-Indicating (Switchboard and Portable Types).
MIL-M-16125	-	Meters, Electrical, Frequency.
MIL-C-28754	-	Connectors, Electrical, Modular, Component Parts, General Specification for.
MIL-C-38999	-	Connectors, Electrical, Circular, Miniature, High Density, Quick Disconnect (Bayonet, Threaded, and Breach Coupling), Environment Resistant, Removable Crimp and Hermetic Solder Contacts, General Specification for.
MIL-C-83527	-	Connectors, Plug and Receptacle, Electrical, Rectangular Multiple Insert Type, Back to Panel, Environment Resisting, 150 °C Total Continuous Operating Temperature, General Specification for.

STANDARDS

DEPARTMENT OF DEFENSE

MIL-STD-462	-	Measurement of Electromagnetic Interference Characteristics.
MIL-STD-810	-	Environmental Test Methods and Engineering Guidelines.
MIL-STD-1377	-	Effectiveness of Cable, Connector, and Weapon Enclosure Shielding and Filters in Precluding Hazards of Electromagnetic Radiation to Ordnance, Measurement of.
MIL-STD-1389	-	Design Requirements for Standard Electronic Modules.
MIL-STD-1472	-	Human Engineering.

MIL-STD-2218 - Thermal Design, Analysis, and Test Procedures for Airborne Electronic Equipment.

(Unless otherwise indicated, copies of the above specifications, standards, and handbooks are available from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.)

2.3 Non-Government publications. The following document forms a part of this document to the extent specified herein. Unless otherwise specified, the issues of the documents which are DoD adopted are those listed in the issue of the DoDISS cited in the solicitation. Unless otherwise specified, the issues of documents not listed in the DoDISS are the issues of the documents cited in the solicitation (see 6.2).

AMERICAN SOCIETY FOR QUALITY CONTROL (ASQC)

ASQC-Z1.4 - Sampling Procedures and Tables for Inspection by Attributes. (DoD adopted)

(Application for copies should be addressed to the American Society for Quality Control, 611 East Wisconsin Avenue, Milwaukee, WI 53202.)

2.4 Order of precedence. In the event of a conflict between the text of this document and the references cited herein, 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 First article. When specified (see 6.2), a sample shall be subjected to first article inspection in accordance with 4.2.

3.2 Materials. The enclosure shall be constructed of materials which shall meet the requirements of this specification.

3.2.1 Corrosion prevention and control. The materials selected shall be corrosion resistant or shall be treated to resist corrosion during service life (see 6.3).

3.2.2 Dissimilar metals. Where dissimilar metals are used in contact with each other, protection against galvanic corrosion shall be provided (see 6.6). When dissimilar metals are used they shall not be susceptible to galvanic corrosion identified in MIL-C-28754, table VII.

3.2.3 Recycled, recovered, or environmentally safe materials. Recycled, recovered, or environmentally safe materials shall be used, provided that the material meets the performance requirements specified herein.

3.3 Interface and dimensional requirements.

3.3.1 Size.

3.3.1.1 Enclosure. The external dimensions of the enclosure, excluding cooling interfaces, shall enclose Modular Concept Units (MCUs) of varying sizes. The enclosure shall be available in the following MCU sizes: 2, 4, 6, 8, 10, and 12. The sizes are provided in table 1 and are shown on figure 1.

3.3.1.2 Enclosure accessibility. Access panels, attachment mechanisms, and gaskets shall be designed to permit access to interior parts, terminals, and wiring for adjustments, required circuit checking, and for parts replacement in reparable assemblies. For routine servicing and maintenance, unsoldering of wires, wire harnesses, parts, and subassemblies shall not be required to gain access to terminals, soldered connections, and mounting screws. Sizes of openings, maximum reach requirements, and allowable sizes and weights of replaceable assemblies shall conform to MIL-STD-1472.

3.3.1.3 Protrusions. All front panel protrusions such as hold-downs, carrying handles, controls, displays, and connectors shall be as shown on figure 1 when the enclosure and its components are in the latched and actuated position. On the rear panel, connector-mounting screwheads shall lie within the limits shown on figure 1. Other protrusions are permitted on the rear panel, provided they are within the diagonally lined envelope shown on figure 1 and that they do not interfere with the interfacing of the enclosure with the rack.

3.3.2 Modularity. The enclosures are part of a modular packaging approach that provides electrical, mechanical, and thermal interfaces for the SEMs. This technique provides for the joining of 2, 4, and 6 MCU-sized enclosures to form 4, 6, 8, 10, and 12 MCU sizes with a minimum of additional components. Each enclosure tier shall accept not less than 13 modules at a 0.60-inch (15.24 mm) pitch. The enclosure shall be capable of interfacing with SEM Format B Span 2, the SEM Format C, and the SEM Format E as described in MIL-STD-1389. Table II provides combinations of enclosure sizes, module sizes, and backplane module interconnection methods in which enclosures shall be configurable. The maximum enclosure mass value provided (see table II) is the maximum weight of an avionics system that can be packaged using an enclosure.

TABLE I. Standard MCU dimensions (see figure 1).

	Width (W)		Height (H)		Length (L) 1/	
MCU size	Inches +0.02	mm +0.5	Inches +0.0, -0.04	mm +0.0, -1.0	Inches	mm
2	2.29	58.3	7.64	194	L_1 12.52 ± 0.04 L_2 12.76 max	L_1 318 ± 1.0 L_2 324 max
4	4.88	124.0	7.64	194	L_1 12.52 ± 0.04 L_2 12.76 max	L_1 318 ± 1.0 L_2 324 max
6	7.50	190.5	7.64	194	L_1 12.52 ± 0.04 L_2 12.76 max	L_1 318 ± 1.0 L_2 324 max
8	10.09	256.3	7.64	194	L_1 12.52 ± 0.04 L_2 12.76 max	L_1 318 ± 1.0 L_2 324 max
10	12.69	322.3	7.64	194	L_1 12.52 ± 0.04 L_2 12.76 max	L_1 318 ± 1.0 L_2 324 max
12	15.29	388.4	7.64	194	L_1 12.52 ± 0.04 L_2 12.76 max	L_1 318 ± 1.0 L_2 324 max

1/ When a deviation to the standard lengths is unavoidable, the following values shall be used, but only with approval from the acquiring activity:

Alternates (L_1):	Alternates (L_2):
19.53 ±0.04 in (496 ±1.0 mm)	9.76 in (502 mm) max (Ref)
7.56 ±0.04 in (192 ±1.0 mm)	7.78 in (198 mm) max (Ref)

3.3.3 Backplane interface. The mechanical interface of the backplanes used to interconnect the modules shall be in accordance with the dimensions on figure 2. This applies to both multilayer and wire wrap backplanes.

TABLE II. Standard enclosure size and configuration.

Enclosure size	Module size	Backplane interconnect medium	Max enclosure Weights, pounds (Kg)
2 MCU	SEM Format B	Multilayer board	14.3 (6.49)
4 MCU	SEM Format C	3 level wire wrap or multilayer board	25.3 (11.48)
4 MCU	2 levels of SEM Format B	2 multilayer boards	25.3 (11.48)
6 MCU	1 level of SEM Format B; 1 level of SEM Format C	2 backplanes using 3 levels of wire wrap each or 2 multilayer boards	35.2 (15.97)
6 MCU	SEM Format E	3 level wire wrap or multilayer boards	35.2 (15.97)
8 MCU	2 levels of SEM Format C	2 backplanes using 3 levels of wire wrap each or 2 multilayer boards	47.3 (21.46)
8 MCU	1 level of SEM Format B; 1 level of SEM Format E	2 backplanes using 3 levels of wire wrap each or 2 multilayer boards	57.2 (25.95)
10 MCU	1 level of SEM Format C; 1 level of SEM Format E	2 backplanes using 3 levels of wire wrap each or 2 multilayer boards	57.2 (25.95)
12 MCU	2 levels of SEM Format E	2 backplanes using 3 levels of wire wrap each or 2 multilayer boards	67.1 (30.44)

3.3.4 Enclosure hold-downs.

3.3.4.1 Front. The enclosure shall be attached with two (one on the 2-MCU enclosure size) hooks or functional equivalents, located on the front of the enclosure as shown on figure 3. These hooks or other means of attachment shall be used to apply the force required to insert the rear-mounted connector, establish preload, and secure the front of the enclosure.

3.3.4.2 Rear. The rear hold-downs shall mate with dagger pin receptacles in accordance with figure 4 or a rack and panel connector but not both.

3.3.5 Module types. The six MCU enclosure types shall accept a random mix of SEM Format E modules mounted at pitches of 0.4, 0.5, and 0.6 inch (10.2, 12.7, and 15.2 mm). The 4-MCU enclosure shall accept a random mix of SEM Format C modules mounted at pitches of 0.3, 0.4, 0.5, and 0.6 inch (7.6, 10.2, 12.7, and 15.2 mm). The 2-MCU enclosure shall accept SEM Format B modules mounted on pitches that are multiples of 0.3 inch (7.6 mm). Card guides uniquely machined for a given system are permissible with all enclosures.

3.3.6 Escape of fluids. The enclosure shall contain a means of allowing for the escape of fluids, such as drain holes. The method used to allow fluids to escape, shall accommodate mounting of the rack in any orientation. Where moisture pockets are unavoidable in unsealed enclosures, provision shall be made for the drainage of such pockets. Desiccants or moisture-absorbent materials shall not be used within moisture pockets.

3.3.7 Cooling. The cooling source shall dissipate the heat in the enclosure, and provide the pressure required for air to flow through the unit.

3.3.8 Fluid entrapment. The enclosure shall not have any feature that may trap a fluid on the exterior of the enclosure, thereby increasing the possibility of fluid entering the module compartment.

3.3.9 Module retainer. The module retainer mechanism shall not be part of the enclosure. The enclosure card guide may be machined to provide interface to module extractors and injectors. If the enclosure guide is machined, this machining shall not interfere with a retaining device to clamp the module to the thermal card guide. Machining for module extractor or injector shall not preclude the use of modules that have no such mechanisms. The mechanism shall also be accessible (see 3.3.1.2) and replaceable by maintenance personnel.

3.3.10 Wiring harness. The enclosure shall be designed to facilitate the removal and installation as an assembly of the enclosure input/output connectors, wiring, EMI filters, and the connectors tying these items to the backplane.

3.3.11 Meters. The enclosure shall be capable of mounting both a time elapsed meter and built-in test status indicators. The enclosure shall be capable of accommodating meters in accordance with MIL-M-7793, MIL-M-16034, and MIL-M-16125.

3.3.12 Input/output connectors.

3.3.12.1 Front. The enclosure shall accommodate front mounted connectors as specified in MIL-C-38999, series III and IV. Connectors shall be removable from the inside of the enclosure.

3.3.12.2 Rear. The rear-mounted rack and panel connector position in the enclosure shall accommodate connectors specified in MIL-C-83527.

3.3.12.3 Connector restriction. Front and rear connectors shall not be used simultaneously.

3.3.13 Nameplate. There shall be provisions to mount a nameplate, including the serial number, on the front of the enclosure.

3.4 Performance requirements.

3.4.1 High temperature. Structural and electrical integrity shall be maintained for temperatures up to 95 °C (203 °F) for prolonged periods of time. The enclosure shall not bind, crack, discolor, or bulge, and the gasket shall not lose its resiliency, or become permanently distorted when tested as specified in 4.5.2.1.

3.4.2 Low temperature. The enclosure shall withstand temperatures down to -55 °C (-67 °F). The enclosure shall maintain structural and electrical integrity during exposure to such temperatures. The enclosure shall not bind, crack, discolor or bulge, and the gasket shall not lose its resiliency, or become permanently distorted when tested as specified in 4.5.2.2.

3.4.3 Temperature shock. The enclosure shall pass the temperature shock test specified in 4.5.2.3 with no physical or performance degradations.

3.4.4 Humidity. The enclosure shall maintain structural and electrical integrity when tested as specified in 4.5.2.4. There shall be no resulting evidence of swelling, absorption of water, change of mechanical properties, corrosion, or other forms of deterioration.

3.4.5 Fungus. Enclosures covered by this specification shall be constructed of materials which are not nutrients to fungus. The enclosure shall pass the test of 4.5.2.5 without any degradation of performance (see 6.4).

3.4.6 Salt fog. The enclosure shall pass the salt fog test specified in 4.5.2.6 with no corrosion, deterioration, or performance degradation.

3.4.7 Acceleration. The enclosure shall pass the acceleration test specified in 4.5.2.7 with no material yield, failure, or loss of joint integrity.

3.4.8 Vibration. The enclosure shall withstand the vibration levels of internally mounted equipment on jet aircraft, helicopters, and propeller driven aircraft. The enclosure shall maintain structural and mechanical rigidity and electrical connectivity when tested as specified in 4.5.2.8. There shall be no resulting material yield, failure, or loss of joint integrity.

3.4.9 Shock. The enclosure shall withstand the physical shock of equipment mounted internally to aircraft making carrier landings. The enclosure shall maintain structural and mechanical rigidity, and electrical connectivity when tested as specified in 4.5.2.9. There shall be no material yield, failure, or loss of joint integrity.

3.4.10 Crash safety. The enclosure shall maintain structural and mechanical rigidity and electrical connectivity when tested as specified in 4.5.2.10.

3.4.11 Thermal effectiveness. The temperature of any module guide rib shall be not greater than 85 °C (185 °F). Cooling air exhaust temperature shall be not greater than 71 °C (159.8 °F). The airflow rate divided by the enclosure power shall be 3.0 lb/KW-minute (1.36 kg/KW-minute) maximum, when tested as specified in 4.5.3.1.

3.4.12 Thermal leakage. The maximum air leakage rate shall be not greater than 0.1 percent of the maximum flow rate through the enclosure, when tested as specified in 4.5.3.2.

3.4.13 Electromagnetic shielding effectiveness. The enclosure shall shield against electric, magnetic, and electromagnetic field radiation, when tested as specified in 4.5.4.1.

3.4.14 Outside-to-inside shielding effectiveness. The outside-to-inside shielding effectiveness of the enclosure shall meet the requirements shown on figure 5 when tested as specified in 4.5.4.2.

4. VERIFICATION

4.1 Classification of inspections. The inspection requirements specified herein are classified as follows:

a. First article inspection (see 4.2).

b. Conformance inspection (see 4.3).

4.2 First article inspection. First article inspection shall be performed on two enclosures when a first article sample is required (see 3.1 and 6.2). This inspection shall consist of the examination and tests listed in table III.

4.3 Conformance inspection. Conformance inspection shall consist of Groups A, B, and C inspections (see tables IV, V, and VI).

TABLE III. First article inspection.

Inspection	Requirement Paragraph	Method Paragraph
Examination		
Materials	3.2	4.5.1
Size	3.3.1	4.5.1
Modularity	3.3.2	4.5.1
Interface and dimensional requirements		
Backplane interface	3.3.3	4.5.1
Enclosure hold-downs	3.3.4	4.5.1
Module types	3.3.5	4.5.1
Escape of fluids	3.3.6	4.5.1
Cooling	3.3.7	4.5.1
Fluid entrapment	3.3.8	4.5.1
Module retainer	3.3.9	4.5.1
Wiring harness	3.3.10	4.5.1
Meters	3.3.11	4.5.1
Input/output connectors	3.3.12	4.5.1
Nameplate	3.3.13	4.5.1
Performance requirements		
High temperature	3.4.1	4.5.2.1
Low temperature	3.4.2	4.5.2.2
Temperature shock	3.4.3	4.5.2.3
Humidity	3.4.4	4.5.2.4
Fungus	3.4.5	4.5.2.5
Salt fog	3.4.6	4.5.2.6
Acceleration	3.4.7	4.5.2.7
Vibration	3.4.8	4.5.2.8
Shock	3.4.9	4.5.2.9
Crash safety	3.4.10	4.5.2.10
Thermal effectiveness	3.4.11	4.5.3.1
Thermal leakage	3.4.12	4.5.3.2
Electromagnetic shielding effectiveness	3.4.13	4.5.4.1
Outside-to-inside shielding effectiveness	3.4.14	4.5.4.2

4.3.1 Group A inspection. Group A inspection shall consist of the examination shown in table IV. Group A inspection shall be performed on those samples selected from an inspection lot in accordance with ASQC-Z1.4, general inspection level II (see 6.5).

TABLE IV. Group A inspection.

Inspection	Requirement Paragraph	Method Paragraph
Examination		
Materials	3.2	4.5.1
Interface and dimensional requirements		
Modularity	3.3.2	4.5.1
Backplane interface	3.3.3	4.5.1
Module types	3.3.5	4.5.1
Escape of fluids	3.3.6	4.5.1
Cooling	3.3.7	4.5.1
Fluid entrapment	3.3.8	4.5.1
Module retainer	3.3.9	4.5.1
Wiring harness	3.3.10	4.5.1
Meters	3.3.11	4.5.1
Input/output connectors	3.3.12	4.5.1
Nameplate	3.3.13	4.5.1

4.3.2 Group B inspection. Group B inspection shall consist of the examination listed in table V. Group B inspection shall be performed on sample units which have been subjected to and have passed the group A inspection. The sampling for Group B inspection shall be in accordance with ASQC-Z1.4, general inspection level II.

TABLE V. Group B inspection.

Inspection	Requirement Paragraph	Method Paragraph
Examination		
Interface and dimensions		
Size	3.3.1	4.5.1
Enclosure hold-downs	3.3.4	4.5.1

4.3.3 Group C inspection. Group C inspection shall consist of the inspections listed in table VI, performed in the order shown. Group C inspection shall be performed on nine units of the same design which have passed groups A and B inspections. The units shall not be subjected to any screening test prior to Group C inspection.

4.3.3.1 Failures. If one or more units fail to pass the group C inspection, the entire sample shall be considered to have failed.

TABLE VI. Group C inspection.

Inspection	Requirement Paragraph	Method Paragraph
High temperature	3.4.1	4.5.2.1
Low temperature	3.4.2	4.5.2.2
Temperature shock	3.4.3	4.5.2.3
Humidity	3.4.4	4.5.2.4
Fungus	3.4.5	4.5.2.5
Salt fog	3.4.6	4.5.2.6
Acceleration	3.4.7	4.5.2.7
Vibration	3.4.8	4.5.2.8
Shock	3.4.9	4.5.2.9
Crash safety	3.4.10	4.5.2.10
Thermal effectiveness	3.4.11	4.5.3.1
Thermal leakage	3.4.12	4.5.3.2
Electromagnetic shielding effectiveness	3.4.13	4.5.4.1
Outside-to-inside shielding effectiveness	3.4.14	4.5.4.2

4.4 Inspection conditions. The following conditions shall exist for tests.

a. Temperature: room ambient (25 °C ± 10 °C) (77 °F ± 18 °F).

b. Altitude: normal ground.

c. Vibration: none.

d. Humidity: room ambient up to 90 percent relative humidity.

4.5 Inspection methods.

4.5.1 Visual inspection. A visual inspection shall be made to ensure that the enclosure meets interface and dimensional requirements specified in 3.3.1 through 3.3.13.

4.5.2 Environmental tests. The shock, vibration, crash safety, and acceleration tests shall be performed with the enclosures containing dummy modules of equal mass which shall bring the enclosure weight to the maximum specified for that enclosure in table II. The enclosure being tested shall be restrained only by its hold-downs.

4.5.2.1 High temperature. The high temperature test shall be performed in accordance with MIL-STD-810, Method 501.3, Procedure II, with a constant temperature exposure of not less than 95 °C (203 °F) (see 3.4.1).

4.5.2.2 Low temperature. The low temperature test shall be performed in accordance with MIL-STD-810, Method 502.3, Procedure II (see 3.4.2).

4.5.2.3 Temperature shock. The temperature shock test shall be performed in accordance with MIL-STD-810, Method 503.3, Procedure I, except that the diurnal cycle shall be replaced by a constant temperature. Temperature cycling shall occur at a maximum rate of change of 8 °C (14.4 °F) per minute. The five-minute maximum transfer time and the test duration of one hour or until stabilization, whichever is longer, shall apply to both hot and cold shocks. The test temperatures shall be –57 °C (-70.6 °F) and 95 °C (203 °F) (see 3.4.3).

4.5.2.4 Humidity. The humidity test shall be performed in accordance with MIL-STD-810, Method 507.3, Procedure III. The enclosure shall withstand relative humidity levels up to 100 percent for 80 hours duration. The test shall be performed with the enclosure resting on each of three mutually perpendicular surfaces (see 3.4.4).

4.5.2.5 Fungus. The fungus test shall be performed in accordance with MIL-STD-810, Method 508.4 (see 3.4 and 6.4).

4.5.2.6 Salt fog. The salt fog test shall be performed in accordance with MIL-STD-810, Method 509.3, Procedure I. This shall include a 48-hour exposure to a five percent salt solution (see 3.4.6).

4.5.2.7 Acceleration. The acceleration test shall be performed in accordance with MIL-STD-810, Method 513.4, Procedure I. Acceleration values shall be computed using table 513.4-I for aircraft with a forward acceleration value of 4 g's. The test time shall be one minute (see 3.4.7).

4.5.2.8 Vibration. The vibration test shall be performed in accordance with MIL-STD-810, Method 514.4, Procedure I. The random vibration envelope shall be in accordance with figure 514.4-8, with a W_o of $0.06g^2$/Hz for the functional tests and $0.2g^2$/Hz for the endurance tests (see 3.4.8).

4.5.2.9 Shock. The shock test shall be performed in accordance with MIL-STD-810, Method 516.4, Procedure I. The test level and duration shall be in accordance with I-3.3.c(1)(b) for functional test of flight vehicle equipment (see 3.4.9).

4.5.2.10 Crash safety. The crash safety test shall be performed in accordance with MIL-STD-810, Method 513.4, Procedure I. Acceleration values shall be 40 g's fore and aft,

14 g's lateral, and 20 g's up and down. The test time shall be one minute. The orientation shall be in accordance with figure 6. There shall be no resulting failure of the mounting attachments; however, bending and distortion are permitted. The test item shall remain in place (see 3.4.10).

4.5.3 Thermal testing.

4.5.3.1 Thermal effectiveness. The thermal effectiveness test shall be conducted in accordance with MIL-STD-2218 using the procedures given in 4.5.3.1.1 through 4.5.3.1.3 (see 3.4.11).

4.5.3.1.1 Test set-up. The enclosure shall be constrained using only its front and rear hold-downs, with cooling air being supplied through the same hardware as in its final installation. Each enclosure will be fully populated with dummy modules dissipating an equal amount of power. The dummy module guide ribs shall have dimensions in accordance with MIL-STD-1389.

4.5.3.1.2 Test conditions. The test shall be run in a 71 ± 1 °C ambient temperature. Cooling air inlet temperature and pressure drop across the enclosure shall be 27 ± 1 °C (80.6 ± 3.6 °F) and 2.5 ± .1 inches (63.5 ± 2.5 mm) of water, respectively. Input power shall be in accordance with table VII.

TABLE VII. Standard enclosure power capacity.

Enclosure size (MCU)	Power capability (watts)
2	250
4	500
6	750
8	1000
10	1250
12	1500

4.5.3.1.3 Instrumentation. The enclosure shall be instrumented to gather the following data:

a. Inlet air temperature and relative humidity.

b. The guide rib temperatures of modules 1, 4, 7, 10, 13, 17, 20, 23, and 26 (numbered sequentially from the air inlet end of the enclosure). These temperatures shall be recorded on enclosures that house 0.3-inch pitch SEMs. Temperatures of modules 1, 2, 5, 7, 9, 10, and 13 shall be recorded on 0.6-inch pitch SEM enclosures (comparable locations for other pitches).

c. The exhaust air temperature.

d. The air mass flow rate through the enclosure.

4.5.3.2 Thermal leakage. The enclosure shall be pressurized to not less than 2 inches (50.8 mm) of water at a temperature of 21 °C (69.8 °F) (see 3.4.12).

4.5.4 Electromagnetic interference testing.

4.5.4.1 Shielding effectiveness. The enclosure shall meet the requirements of 3.14.13 when tested as specified in MIL-STD-1377.

4.5.4.2 Outside-to-inside shielding effectiveness. The enclosure shall meet the requirements of 3.14.14 when tested as specified in MIL-STD-1377.

5. PACKAGING

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When actual packaging of materiel is to be performed by DoD personnel, these personnel need to contact the responsible packaging activity to ascertain requisite packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activity within the Military Department or Defense Agency, or within the Military Department's System Command. 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 that may be helpful, but is not mandatory.)

6.1 Intended use. The enclosures covered by this specification are used in the production and maintenance of military aircraft exposed for prolonged periods to extreme seagoing environments not encountered by civilian aircraft. These enclosures provide cooling for the enclosed devices, protection from the environment, and shielding from electromagnetic interference (EMI) unique to the military environment. The enclosures covered by this specification are not used in commercial aircraft.

6.2 Acquisition requirements. Acquisition documents must 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 2.2.1).

c. Whether first article inspection is required (see 3.1).

d. Size of enclosure (see 3.3.1.1).

e. Mounting configuration and required interfaces (see 3.3.1.1 and 3.3.2).

f. Deviation from the length of the enclosures, if required (see table I).

g. Number, format, and placement of modules on backplanes (see 3.3.2).

h. Module size for 4-MCU and 6-MCU enclosures (see table II).

i. Cooling resources and necessary appropriate interfaces (see 3.3.7).

j. Electrical connector type and placement (see 3.3.12).

k. Packaging requirements (see 5.1).

6.3 Corrosion prevention and control. Guidance regarding the prevention and control of corrosion (see 3.2.1) is given in MIL-HDBK-454, Guideline 15. For use of corrosion resistant materials, see MIL-HDBK-1568.

6.4 Fungus. Subject to the approval by the contracting officer, certification that the enclosure has been constructed of materials which are not nutrients for biological growth may be accepted in lieu of the fungus test of 4.5.2.5. For guidance regarding fungus inert materials (see 3.4.5), see MIL-HDBK-454, Guideline 4.

6.5 Inspection lot. An inspection lot shall consist of all enclosures of the same size and design produced under the same conditions and offered for inspection at one time.

6.6 Dissimilar metals. MIL-STD-889 identifies means for protecting joined dissimilar metals.

6.7 Subject term (key word) listing.

Aircraft
Backplane
Electronic
Modules
Protrusions

6.8 Changes from previous issue. Marginal notations are not used in this revision to identify changes with respect to the previous issue due to extent of the changes.

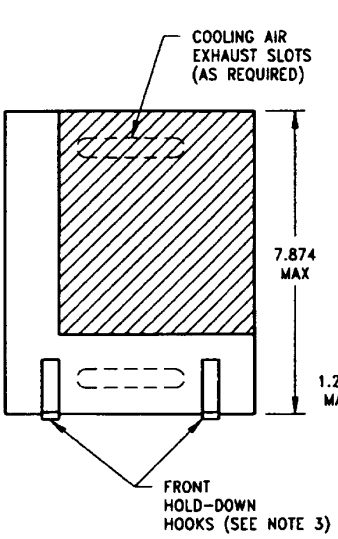


FIGURE 1A. FRONT VIEW

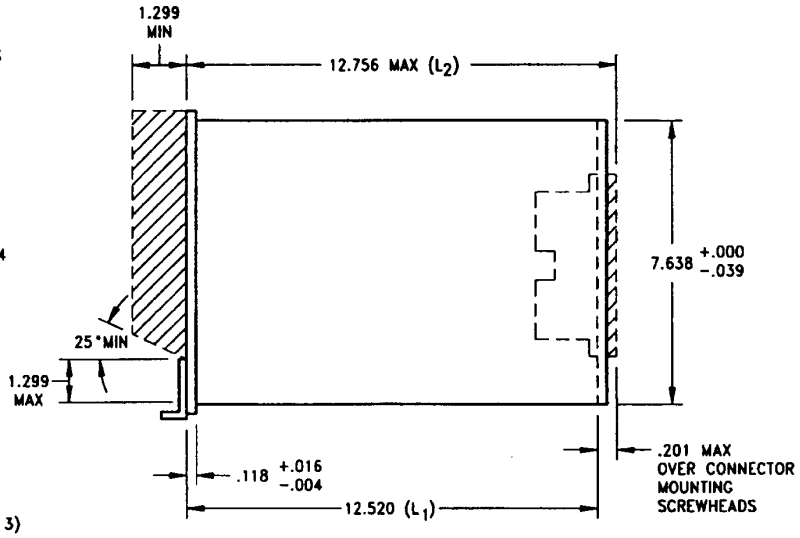


FIGURE 1B. SIDE VIEW

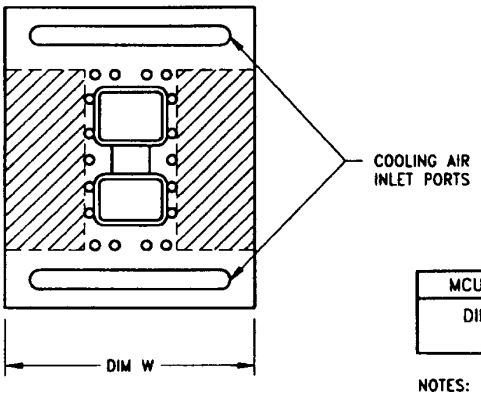


FIGURE 1C. BACK VIEW

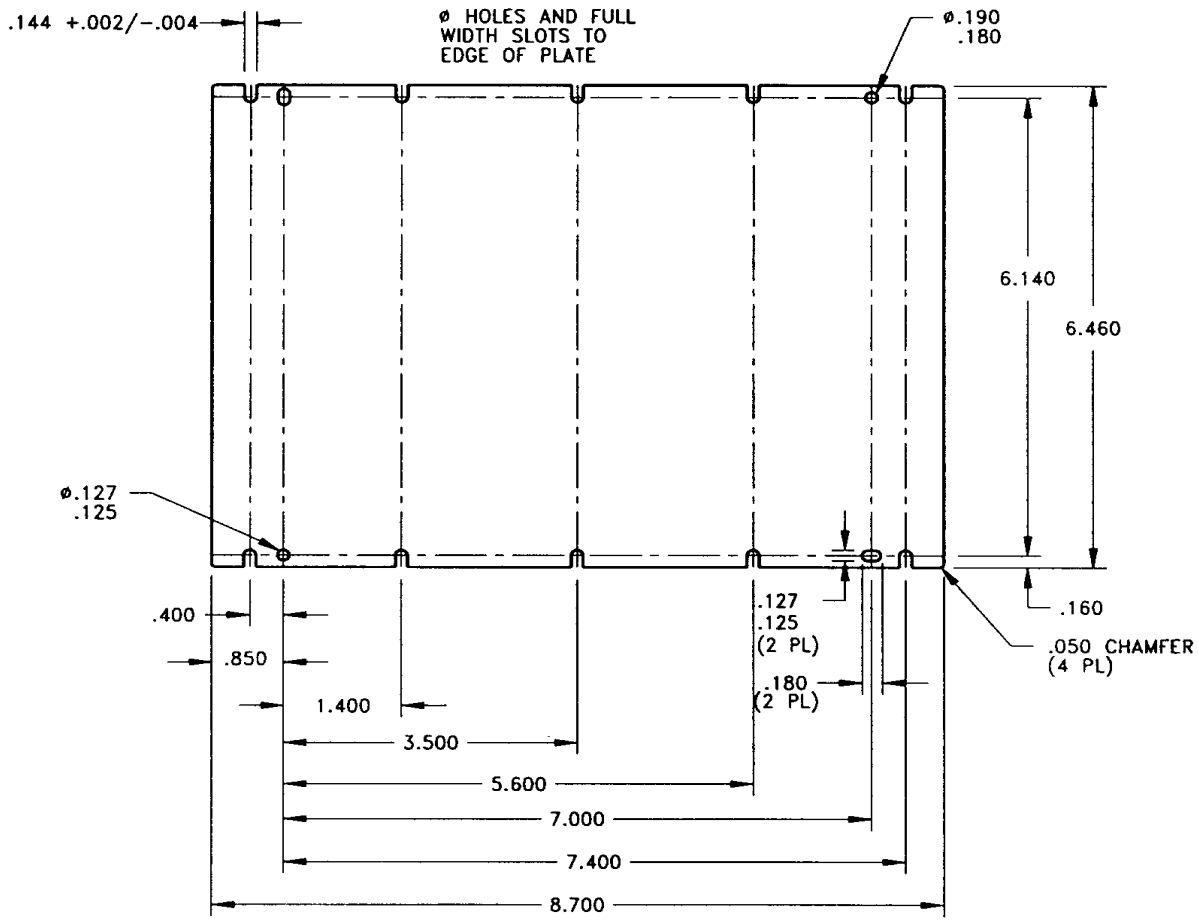
INCHES	MM	INCHES	MM
0.004	0.1	1.299	33.0
0.016	0.4	7.638	194.0
0.039	1.0	7.874	200.0
0.118	3.0	12.520	318.0
0.201	5.1	12.756	324.0

MCU SIZE	2	4	6	8	10	12
DIM W	2.25 (57.2)	4.88 (124)	7.50 (190.5)	10.09 (256.3)	12.69 (322.3)	15.29 (388.4)

NOTES:

1. DIMENSIONS ARE IN INCHES.
2. UNLESS OTHERWISE SPECIFIED, THE TOLERANCE IS 0.039 INCH (±1.0mm)
3. THE 2-MCU ENCLOSURE USES ONE ENCLOSURE HOLD-DOWN.

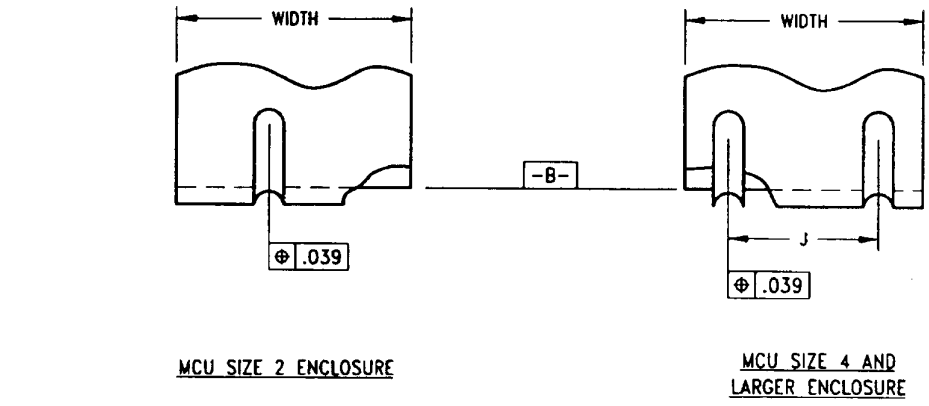
FIGURE 1. Standard MCU case.

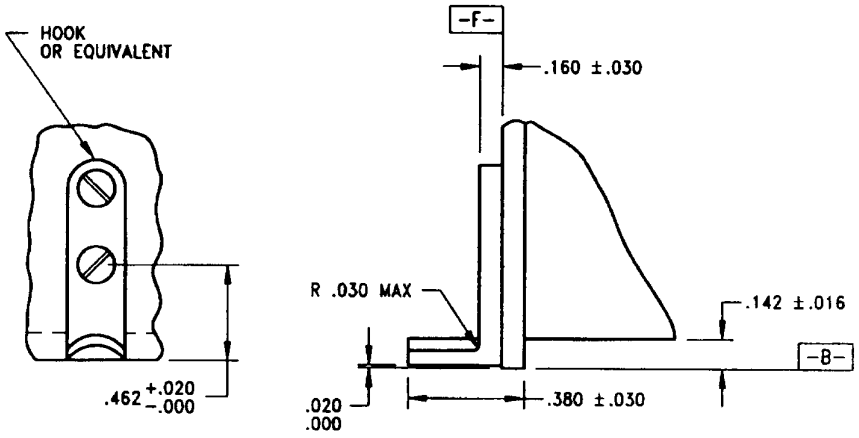


NOTE:
1. DIMENSIONS ARE IN INCHES.

INCHES	MM	INCHES	MM
0.002	0.051	1.400	35.560
0.004	0.102	3.500	88.900
0.050	1.270	5.600	142.240
0.125	3.175	6.140	155.956
0.127	3.226	6.460	164.084
0.144	3.658	7.000	177.800
0.160	4.064	7.400	187.960
0.180	4.572	8.700	220.980
0.190	4.826		
0.400	10.160		
0.850	21.590		

FIGURE 2. Backplane mechanical interface.





INCHES	MM
0.016	0.41
0.020	0.51
0.030	0.76
0.039	1.00
0.142	3.61
0.160	4.06
0.380	9.65
0.462	11.73

LEGEND:

-B- REFERENCE BOTTOM SURFACE OF ENCLOSURE

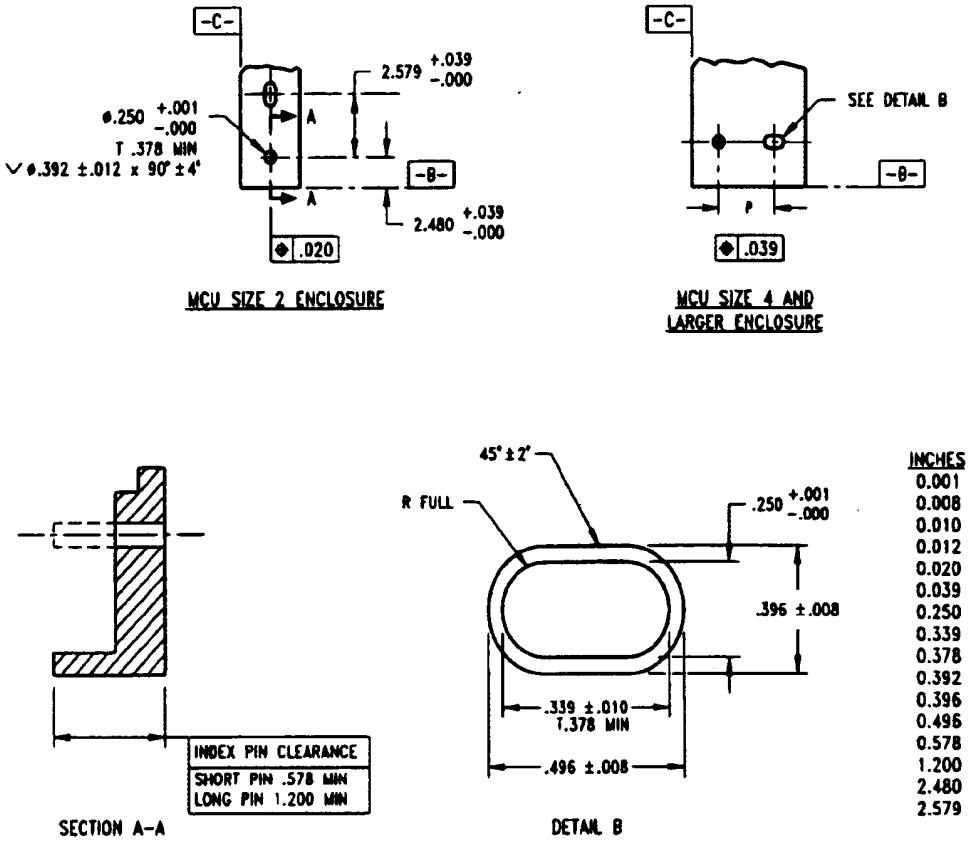
-F- REFERENCE VERTICAL SURFACE ON FRONT PANEL OF ENCLOSURE

MCU SIZE	4	6	8	10	12
DIM J ±.020 (±.5)	2.600 (66.0)	5.200 (132.1)	7.80 (198.1)	10.400 (264.2)	13.000 (330.2)

NOTE:

1. DIMENSIONS ARE IN INCHES.

FIGURE 3. Front hold-down.



INCHES	MM
0.001	0.025
0.008	0.20
0.010	0.25
0.012	0.30
0.020	0.51
0.039	1.00
0.250	6.35
0.339	8.61
0.378	9.60
0.392	9.96
0.396	10.06
0.496	12.60
0.578	14.68
1.200	30.48
2.480	62.99
2.579	65.51

LEGEND:

-B- REFERENCE BOTTOM SURFACE OF ENCLOSURE

-C- REFERENCE THEORETICAL VERTICAL CENTERPLANE OF ENCLOSURE MEASURED ON THE INSIDE OF THE REAR PANEL

P DIMENSION BETWEEN HOLD-DOWN PINS FOR MCU SIZES 4 THROUGH 12

MCU SIZE	4	6	8	10	12
DIM P ±.020 (±.50)	2.600 (66.0)	5.200 (132.1)	7.80 (198.1)	10.400 (264.2)	13.000 (330.2)

NOTE:

1. DIMENSIONS ARE IN INCHES.

FIGURE 4. Rear hold-downs.

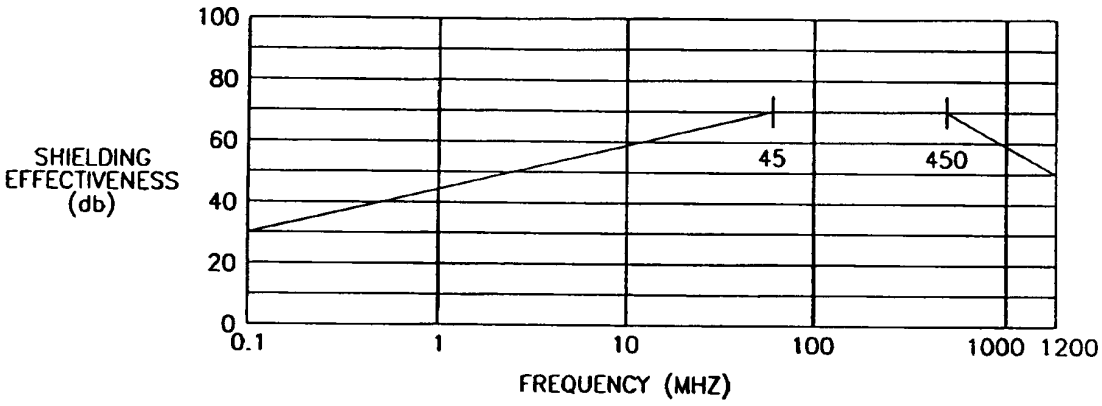


FIGURE 5. EMI shielding design requirements.

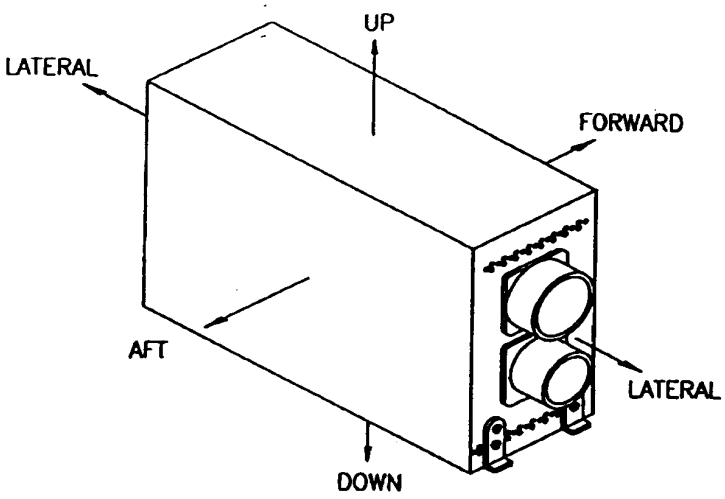


FIGURE 6. Standard enclosure test orientation.

CONCLUDING MATERIAL

Preparing activity:
Navy (AS)

(Project 5975-N099)

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

INSTRUCTIONS

1. The preparing activity must complete blocks 1, 2, 3, and 8. In block 1, both the document number and revision letter should be given.

2. The submitter of this form must complete blocks 4, 5, 6, and 7.

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I RECOMMEND A CHANGE:	1. DOCUMENT NUMBER MIL-PRF-85726B(AS)	2. DOCUMENT DATE (*YYMMDD*) 15 July 1998

3. DOCUMENT TITLE
ENCLOSURE, STANDARD AVIONICS, FORCED AIR-COOLED, SPECIFICATION FOR

4. NATURE OF CHANGE (*Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets as needed.*)

5. REASON FOR RECOMMENDATION

6. SUBMITTER

a. NAME (*Last, First, Middle Initial*)	b. ORGANIZATION	
c. ADDRESS (*Include Zip Code*)	d. TELEPHONE (*Include Area Code*) (1) Commercial: (2) DSN: (*If Applicable*)	7. DATE SUBMITTED (*YYMMDD*)

8. PREPARING ACTIVITY

a. NAME COMMANDER NAVAL AIR WARFARE CENTER AIRCRAFT DIVISION	b. TELEPHONE NUMBER (*Include Area Code*) (1) Commercial: (732) 323-2947 (2) DSN: 624-2947
c. ADDRESS (*Include Zip Code*) CODE 414100B120-3 HIGHWAY 547 LAKEHURST, NJ 08733-5100	IF YOU DO NOT RECEIVE A REPLY WITHIN 45 DAYS, CONTACT: Defense Logistics Agency, (DLSC-LM) Attn; Carla Jenkins/John Tascher 8725 John J. Kingman Road, Ste 2533 Fort Belvoir, VA 22060-6221 Telephone (703) 767-6874