

MIL-L-22769A (WEP)
15 JANUARY 1962

SUPERSEDING
MIL-L-22769 (WEP)
1 FEBRUARY 1961

MILITARY SPECIFICATION

LAUNCHER, WEAPONS, AIRBORNE AND ASSOCIATED EQUIPMENT

GENERAL SPECIFICATION FOR

This specification has been approved by the
 Bureau of Naval Weapons, Department of the Navy.

1. SCOPE

1.1 Scope - This specification covers the general requirements for equipment used on aircraft to suspend and launch missiles, sonobuoys, bombs, marine location markers, rockets, aircraft parachute flares, torpedoes, underwater sound signals, aircraft depth bombs, bathythermographs, depth charges, etc. This specification also covers items of equipment used to operate and control the operation of the launching equipment, but does not cover items of equipment used to compute the launching point.

2. APPLICABLE DOCUMENTS

2.1 The following documents of the issue in effect on the date of invitation for bids form a part of this specification to the extent specified herein:

SPECIFICATIONS

MIL-W-5088	Wiring, Aircraft, Installation of
MIL-E-5400	Electronic Equipment, Aircraft, General Specification for
MIL-H-5440	Hydraulic System; Aircraft Type I and II, Design Installation and Data Requirements For
MIL-P-5518	Pneumatic System; Design, Installation, and Tests in Aircraft
MIL-I-6181	Interference Control Requirements, Aircraft Equipment
MIL-F-7179	Finishes and Coatings; General Specification for Protection of Aircraft
MIL-P-7936	Parts and Equipment, Aeronautical, Preparation for Delivery
MIL-P-8564	Pneumatic Components, Aeronautical - General Specification for

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MIL-A-8591	Airborne Stores and Associated Suspension Equipment, General Design Criteria for
MIL-H-8775	Hydraulic System Components, Aircraft, General Specification For
MIL-N-18307	Nomenclature and Nameplates for Aeronautical Electronic and Associated Equipment
MIL-D-21625	Design and Evaluation of Cartridges for Cartridge Actuated Devices
MIL-R-22973	Reliability Index Determination for Avionic Equipment Models, General Specification for
MIL-R-23094	Reliability Assurance for Production Acceptance of Avionic Equipment, General Specification for
MIL-C-26482	Connectors, Electric, Circular, Miniature, Quick Disconnect
MIL-D-70327	Drawings, Engineering and Associated Lists

STANDARDS

MIL-STD-130	Identification Marking of U. S. Military Property
MIL-STD-143	Specifications and Standards, Order of Precedence for the Selection of
MIL-STD-704	Electric Power, Aircraft, Characteristics and Utilization of
MIL-STD-756	Reliability of Weapons Systems, Procedures for Prediction and Reporting Prediction of
MS25245	Connections, Input Power Airborne Electronic Equipment; 28-Volt DC, 115-Volt Single Phase AC, or 115/200-Volt-3-Phase AC, or Combinations
MS33586	Metals, Definition of Dissimilar

PUBLICATIONS

Air Force - Navy Aeronautical Bulletin

No. 440 Type Designation System for Aeronautical Support Equipment

2.2

Availability of Documents

- (1) When requesting specifications, standards, drawings, and publications refer to both title and number. Copies of this specification and applicable specifications required by contractors in connection with specific procurement functions may be obtained upon application to the Commanding Officer, Naval Supply Depot, Code CDS, 5801 Tabor Avenue, Philadelphia 20, Pennsylvania.

3. REQUIREMENTS

3.1 Parts, Materials, and Processes - Parts, materials, and processes used by the manufacturer of the launching equipment shall be of high quality, suitable for the purpose, and shall conform to applicable Government specifications except that contractor's specifications may

be used provided the specifications are released by the procuring activity and contain provisions for adequate tests. The use of contractor's specifications shall not constitute waiver of Government inspection.

3.1.1 Metals - All metals used in the construction of the launching equipment that are not a corrosion-resisting type shall be protected to resist corrosion during the service life of the launching equipment. The use of dissimilar metals shall be avoided. Dissimilar metals are defined by Drawing MS33586.

3.1.2 Selection - Specifications and standards for all materials, parts and Government certification of processes and equipment, which are not specifically designated herein and which are necessary for the execution of this specification, shall be selected in accordance with MIL-STD-143.

3.1.3 Standard Parts - Standard parts (MS, AN, or JAN) shall be used wherever they are suitable for the purpose and shall be identified on the drawings by their standard part numbers. Commercial utility parts such as screws, bolts, nuts, cotter pins, etc., may be used provided they possess suitable properties and are replaceable by the standard parts without alteration and provided the corresponding standard part numbers are referenced in the parts list and on the drawings.

3.1.4 Part and Process Approval - All parts and processes shall be adequately tested prior to their use in the equipment.

3.2 Design and Construction - The launching equipment shall be designed and constructed to withstand the stresses, vibrations, and shocks incident to shipping, storage, installation and service use. The launching equipment shall be designed and constructed so that no fixed part or assembly shall become loose, no moving or movable part or assembly shall become free or sluggish in operation, no movable part or control shall be shifted in setting, position, or adjustment, and no degradation shall be caused in the performance below that specified in the model specification for the launching equipment during operation or after storage of the launching equipment in environmental conditions specified herein.

3.2.1 Electrical Requirements - Launching equipment incorporating electrical devices shall conform to MIL-STD-704 and Specification MIL-W-5088.

3.2.1.1 Grounding - Each electrical connector used in the launching equipment shall have a ground return terminal.

3.2.1.2 Input power connections - Electrical input power connections shall be in accordance with Drawing MS25245.

3.2.1.3 Interconnection Cabling - The launching equipment shall be capable of satisfactory operation using external wiring in accordance with Specification MIL-W-5088.

3.2.1.4 Dielectric Strength - The dielectric shall be capable of withstanding without failure an electro-motive force of at least 1000 volts, root-mean-square, alternating current, applied between each electrical circuit and all other electrical circuits and between each circuit and the structural ground. The frequency of the applied voltage shall be in the range of 50 to 100 cps.

3.2.1.5 Insulation Resistance - The insulation resistance of the electrical circuits and devices shall be one megohm or more. The insulation resistance shall be measured at a constant potential of 500 volts direct current by means of a megger or other suitable method. The resistance shall be measured between each circuit and the structural ground and between each circuit and all other circuits.

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3.2.1.6 Electrical connectors - Electrical connectors shall be in accordance with Specification MIL-C-26482.

3.2.2 Hydraulic devices - Launching equipment incorporating hydraulic devices shall conform to Specifications MIL-H-5440 and MIL-H-8775.

3.2.3 Pneumatic Devices - Launching equipment incorporating hydraulic devices shall conform to Specifications MIL-P-5518 and MIL-P-8564.

3.2.4 Cartridge actuated devices - Launching equipment incorporating cartridge actuated devices shall conform to the applicable requirements of Specification MIL-D-21625.

3.2.5 Electronic Devices - Launching equipment incorporating electronic devices shall conform to the applicable requirements of Specification MIL-E-5400.

3.2.6 Temperature - The launching equipment shall be capable of withstanding without failure, in the operating and nonoperating condition, exposure to temperatures within the range of -87°C to $+85^{\circ}\text{C}$. The temperatures within this range may remain constant for long periods and may vary at a rate as high as 1°C per second.

3.2.7 Altitude - The launching equipment shall be capable of withstanding without failure, in the operating and nonoperating conditions, exposure to altitudes within the range of sea level (30.0 in. Hg) to 70,000 feet (1.3 in. Hg). The altitude may remain constant for long periods and may vary at a rate as high as 0.5 inch of mercury per second.

3.2.8 Humidity -- The launching equipment shall be capable of withstanding without failure, in the operating and nonoperating condition, the effects of relative humidities up to 100 percent, including conditions wherein condensation takes place in and on the launching equipment in the form of both water and frost.

3.2.9 Vibration - The launching equipment shall be capable of withstanding without failure, in the operating and nonoperating conditions, vibrations within the frequency range of 5 to 500 cycles per second. The double amplitude shall be 0.1 inch or $\pm 10\text{G}$ whichever is the limiting value.

3.2.10 Shock - The launching equipment, with rounds installed in the condition predicted to produce the most critical stresses, shall be exposed to shock conditions specified herein.

3.2.10.1 Structural integrity -- The launching equipment shall not suffer damage or subsequently fail to provide the performance specified in the model specification when subjected to impact shocks of 15G magnitude having a time duration of 11 ± 1 milliseconds.

3.2.10.2 Crash safety - The launching equipment shall remain in place and shall retain the rounds when subjected to impact shocks of 30 G. Bending and distortion will be permitted. There shall be no failure of the attachment joints.

3.2.11 Sand and Dust - The launching equipment shall be capable of withstanding without failure, in both an operating and nonoperating condition, exposure to sand and dust concentrations of 0.1 to 0.5 gram per cubic foot for three hours at a relative humidity of 30 percent or less, an air velocity of 2,500 \pm 500 feet per minute, and a temperature of 71°C. The sand and dust shall be of angular structure and shall have characteristics as follows:

- (a) 100 percent of the sand and dust shall pass through a 100-mesh screen, U. S. Standard Sieve Series.
- (b) 98 \pm 2 percent of the sand and dust shall pass through a 140-mesh screen, U. S. Standard Sieve Series.
- (c) 90 \pm 2 percent of the sand and dust shall pass through a 200-mesh screen, U. S. Standard Sieve Series.
- (d) 75 \pm 2 percent of the sand and dust shall pass through a 325-mesh screen, U. S. Standard Sieve Series.
- (e) Chemical analysis of the sand and dust shall be as follows:

<u>Substance</u>	<u>Percent by weight</u>
SiO ₂	97 to 99
Fe ₂ O ₃	0 to 2
Al ₂ O ₃	0 to 1
TiO ₃	0 to 2
Mg ⁰	0 to 1
Ign losses	0 to 2

3.2.12 Fungus - The launching equipment shall withstand, in an operating and non-operating condition, exposure to fungus growth as encountered in tropical climates. The launching equipment shall be fungus-proofed by selection of parts and materials that are non-nutrient for fungi, or the parts and materials shall be treated prior to their use in the launching equipment so that overall spraying is unnecessary.

3.2.13 Rain - Launching equipment intended for external installation shall be capable of withstanding without failure, in the operating and nonoperating condition, exposure to rain at the rate of 4 inches per hour.

3.2.14 Sunshine - Launching equipment intended for external installation shall be capable of withstanding without a failure, in the operating and nonoperating condition, exposure to radiant energy at the rate of 140 watts per square foot of projected area. Fifty to 84 watts per square foot shall be in wave lengths above 7,800 angstrom units and four to eight watts per square foot shall be in wave lengths below 3,800 angstrom units.

3.2.15 Explosive Conditions - The launching equipment shall not cause ignition of an ambient explosive atmosphere when operated therein. Cartridge actuated devices shall have provisions for venting overboard the products of propellant combustion or of completely sealing the combustion chamber.

3.2.16 Acceleration - The launching equipment shall be capable of satisfactory operation while being subjected to forces in accordance with Specification MIL-A-8591 up to design limit load, shall not exhibit permanent deformation after being subjected to design yield load and shall not fail when subjected to design ultimate load.

3.2.17 Salt Atmosphere - The launching equipment shall withstand without failure, in the operating and nonoperating condition, exposure to salt-sea atmosphere.

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3.3 Reliability - The launching equipment shall be capable of the operational stability and total operating life specified herein. Equipment reliability shall be analyzed, calculated, and reported in accordance with MIL-STD-756.

3.3.1 Operational stability - The launching equipment shall be capable of launching 100 rounds without the necessity for readjustment of any parts or controls which are inaccessible during flight.

3.3.2 Total Operating Life - The launching equipment shall be capable of launching 5,000 rounds with reasonable servicing and replacement of parts. Parts requiring replacement within this interval and the life of such parts shall be specified by the manufacturer. Each part shall have a life of at least 1,000 launchings.

3.3.3 Life meter - A rounds counter shall be included in the launcher to record the total number of rounds launched and a time totalizer shall be included in other high cost equipments which operate on a time basis.

3.4 Maintainability - The launching equipment shall provide connections for such test equipment as may be required for operational check-out tests.

3.4.1 Standard test equipment - The launching equipment shall permit the use of items of standard service test equipment to accomplish all necessary tests.

3.4.2 Special tools - The launching equipment shall be capable of disassembly and replacement of parts without the use of special tools.

3.5 Radio - interference suppression - The generation of radio interference by the launching equipment and the vulnerability of the launching equipment to radio interference shall be controlled within the limits of Specification MIL-I-6131.

3.6 Finish - The launching equipment and its parts shall be finished in accordance with the applicable requirements of Specification MIL-F-7179.

3.7 Nameplates and product markings - A nameplate conforming with Specification MIL-N-18307 shall be attached securely to a fixed part of the launching equipment. Parts shall be marked in accordance with Standard MIL-STD-130. Nomenclature assignment per ANA Bulletin No. 440, nameplate approval, and serial number assignment shall be in accordance with Specification MIL-N-18307.

3.8 Interchangeability - All parts having the same manufacturer's part number shall be directly and completely interchangeable with each other with respect to installation and performance. Parts joined together as by welding or riveting shall be interchangeable as assemblies. Changes in manufacturer's part numbers shall be governed by the item identification and part numbering requirements of Specification MIL-D-70327.

3.9 Workmanship - The launching equipment, including all parts and accessories, shall be constructed and finished in a thoroughly

workmanlike manner. Particular attention shall be paid to neatness and thoroughness of soldering, wiring, plumbing, impregnation of coils, marking of parts and assemblies, plating, painting, riveting, machine screw assemblage, welding and brazing, and freedom of parts from burrs and sharp edges.

3.9.1 Dimensions - Dimensions and tolerances not specified shall be as close as is consistent with best shop practice. When dimensions and tolerances affect the interchangeability, operation, or performance of the launching equipment, the dimensions and tolerances shall be held or limited accordingly.

3.9.2 Fabrication - Machining, drilling, and forming shall be done with the use of accurate jigs, templates, or gages.

3.9.3 Screw-assemblies - Assembly screws shall be tight. The word "tight" means that the screws cannot be tightened appreciably further without damage or injury to the screw threads.

3.9.4 Riveting - Riveting operations shall be performed carefully so that the rivets are tight. Rivet heads shall be full size and concentric with the body. Dimensions of the rivets shall be such that the holes will be filled. Loose, cracked, or badly formed riveting, including protruding countersunk rivet heads, shall be replaced before acceptance of the launcher. Excess metal shall be removed from countersunk rivet heads as a customary operation. This does not cover eyelets or hollow tubular rivets which shall not be used.

3.9.5 Gears - Gear assemblies shall be aligned and meshed properly and shall be operable without interference, tight spots, loose spots, or other irregularities. When required for accurate adjustment, gear assemblies shall be free from detrimental backlash.

3.9.6 Wire stripping - Wire stripping shall be done without nicking or otherwise damaging the conductor.

3.9.7 Cleanup - The launching equipment shall be cleaned thoroughly of loose parts, spattered or excess solder, metal chips, and other foreign material after final assembly.

4. QUALITY ASSURANCE PROVISIONS

4.1 The supplier is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified, the supplier may utilize his own or any other inspection facilities and services acceptable to the Government. Inspection records of the examination and tests shall be kept complete and available to the Government as specified in the contract or order. The Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

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4.2 Classification of Tests - The inspection and testing of launching equipment shall be classified as follows:

- (a) Design approval tests
- (b) Preproduction tests
- (c) Acceptance tests

4.3 Design Approval Tests - Design Approval Tests are those tests conducted to demonstrate the feasibility and practicability of the launching equipment design and the suitability of a launching equipment or component for limited use in experimental aircraft flight testing.

4.3.1 Design Approval Sample - The Design Approval Sample shall consist of three units of the launching equipment or components in addition to the quantity under contract.

4.3.2 Scope of Design Approval Tests - As a minimum, the Design Approval Sample shall be subjected to the tests listed in Table I. Tests for dielectric strength and insulation resistance shall be performed before and after the Design Approval Tests. Tear-down shall be performed as specified.

TABLE I

DESIGN APPROVAL TESTS

Test	Sample Unit Number		
	1	2	3
High Temperature	X		
Low Temperature	X		
Temperature Shock	X		
Altitude	X		
Sunshine*	X		
Rain*		X	
Humidity		X	
Fungus		X	
Salt Spray		X	
Sand and Dust			X
Immersion*			X
Explosion			X
Shock $\pm 15G$			X
Vibration			X
Total Operating Life	X	X	X
Shock $\pm 30G$			X

* When required by model specification

4.3.3 Approval of the launching equipment or component design will be by the using activity upon successful completion of all Design Approval Tests after review by the using activity of the report of test results submitted by the contractor.

4.4 Preproduction Tests - Preproduction Tests are those tests accomplished on launching equipment or components to demonstrate the suitability of launching equipment model or component for production.

4.4.1 Preproduction Sample - The Preproduction Sample shall consist of six units of product in addition to the quantity under contract. The Preproduction Sample shall have been manufactured using the regular production facilities.

4.4.2 Scope of Preproduction Tests - As a minimum, the Preproduction Tests shall consist of the test, listed in Table II. Tests for dielectric strength and insulation resistance shall be performed before and after the Preproduction Tests. Teardown shall be performed as specified.

TABLE II
PREPRODUCTION TESTS

Test	Sample Unit Number					
	1	2	3	4	5	6
High Temperature	X		X			
Low Temperature	X			X		
Temperature Shock	X				X	
Altitude		X	X			
Sunshine*		X				
Rain*			X			
Humidity		X	X			
Fungus				X		
Salt Spray					X	X
Sand and Dust				X		X
Immersion*						X
Explosion					X	X
Shock ± 15G		X		X		
Vibration	X					X
Total Operating Life	X	X	X	X	X	X
Shock ± 30G		X		X		

* When required by model specification.

4.4.3 Approval of the launching equipment or component for production will be by the using activity upon successful completion of all Preproduction Tests after review by the using activity of the report of test results submitted by the contractor.

4.5 Acceptance Tests - Acceptance Tests are those tests conducted on products submitted for acceptance under contract to demonstrate that the quality of the products is equal to or better than the Preproduction Sample. Acceptance tests shall consist of Individual Tests and Sampling Tests.

4.5.1 Individual Tests - Each launching equipment or component submitted for acceptance shall be subjected to the Individual Tests. These tests shall be adequate to determine compliance with the requirements of parts, material, processes, workmanship, and operational adequacy. As a minimum, each launching equipment or component accepted shall have passed the following tests:

- (a) Examination
- (b) Operational adequacy
- (c) Dielectric strength
- (d) Insulation resistance

4.5.2 Sampling Tests - Sampling tests shall be performed in accordance with Specification MIL-R-23094 test level I. Teardown shall be performed as specified.

4.6 Test Methods

4.6.1 Environmental Tests - The following environmental tests shall be performed in accordance with Specification MIL-E-5272 unless otherwise specified in the model specification:

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<u>Test</u>	<u>Procedure</u>	<u>Test</u>	<u>Procedure</u>
High Temperature	II	Fungus resistance	I
Low Temperature	I	Sunshine	I
Temperature Shock	I	Rain	II
Humidity	I	Sand and Dust	III
Altitude	VI	Immersion	I
Salt Spray	I	Explosion	III
Vibration	XII	Shock	V

4.6.2 Dielectric Strength - An electro-motive force of at least 1000 volts, root mean square, alternating current, shall be applied between each electrical circuit and all other electrical circuits and between each circuit and the structural ground for a duration of one minute. The frequency of the applied voltage shall be in the range of 50 to 100 cps. Break-down, puncturing of insulation, or arcing as shown by a suitable indicating device shall constitute a failure to pass this test.

4.6.3 Insulation Resistance - A constant potential of 500 volts direct current shall be applied between each electrical circuit and all other electrical circuits and between each circuit and the structural ground for a duration of not more than one minute. A measured insulation resistance of less than one megohm as shown by a megger or other suitable method shall constitute a failure to pass this test.

4.6.4 Total Operating Life - The launching equipment shall be subjected to 5,000 launchings, including the launchings required by the other tests specified herein. Total operating life test shall be performed in accordance with Specification MIL-R-22973 test level I.

4.6.5 Teardown - After completion of the Total Operating Life Test, whenever performance exceeds specification tolerances, and at each failure, the launching equipment and components shall be completely disassembled for examination of all parts. Measurements shall be made as necessary to disclose excessively worn, distorted, or weakened parts. Whenever the tests are conducted by the contractor, these measurements shall be compared with similar measurements made prior to the tests. When the tests are conducted by the Government, these measurements shall be compared with the contractor's blueprint dimensions and tolerances or with measurements made prior to the tests, when available.

4.6.6 Examination -

4.6.6.1 Components - The inspector shall ascertain that prior to assembly all components produced under separate specifications or drawings have been inspected, tested, and accepted in accordance with their respective specifications or drawings.

4.6.6.2 Parts, materials, and processes - The inspector shall ascertain that prior to fabrication all parts and materials produced under separate specifications or drawings have been inspected, tested, and accepted in accordance with their respective specifications or drawings and that all processes used in the fabrication of parts and assemblies have been certified to their respective specifications and that the certification is current.

4.6.6.3 Launching Equipment - Each launching equipment shall be examined carefully to determine that the workmanship requirements have been met and that the launching equipment conforms to the applicable drawings.

4.6.7 Operational Adequacy - The launching equipment or component shall be operated to permit sufficient characteristics to be measured and recorded to assure satisfactory operation.

4.7 Rejection and Retest -

4.7.1 Defective units - All defective parts, assemblies, or launching equipments shall be rejected. Rejected units may be reworked by the contractor and resubmitted for acceptance.

4.7.2 Lots - Whenever a sample unit fails to meet any requirement, the lot represented by the sample unit shall be rejected. Rejected lots may be reworked by the contractor and resubmitted for acceptance. All Acceptance Tests shall be performed on a resubmitted lot.

5. PREPARATION FOR DELIVERY

5.1 All major units and parts of the launching equipment shall be preserved, packaged, and marked for shipment in accordance with Specification MIL-P-7936 for the level of shipment specified in the contract or order.

6. NOTES

6.1 Intended use- The launching equipment covered by this Specification are intended for the suspension and launching of weapons from aircraft.

6.2 This specification shall be referenced in all individual model specifications including specifications for launching equipment in the development stage.

6.3 Since this specification is general in scope, the details of performance of the launching equipment under the conditions stated herein, and the ordering information must be specified elsewhere. Attention of design engineers is invited to the items listed below which should be covered in the individual model specification:

(a) Detail performance requirements including:

- (1) Ejection velocity of rounds
- (2) Tolerance on ejection velocity
- (3) Maximum power consumption
- (4) Frequency
- (5) Band pass
- (6) Control limits

(b) Installation characteristics including:

- (1) Mounting details (including normal mounting position if critical)
- (2) Over-all dimensions
- (3) Location size, and type of plumbing and electrical connections
- (4) Servicing clearances
- (5) Direction of ejection
- (6) Recoil travel and force

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- (c) Material of construction including:
 - (1) Material
 - (2) Treatment
 - (3) Finish
- (d) Physical characteristics including:
 - (1) Weight (including gross weight, weight empty, useful load, and unit weight of useful load items)
 - (2) Strength
 - (3) Schematic wiring and plumbing diagrams
 - (4) Exterior color
- (e) Modifications of construction requirements
- (f) Modifications of reliability requirements
- (g) Detail maintainability requirements
- (h) Detail preproduction or design approval test requirements
- (i) Detail acceptance test requirements
- (j) Preparation for delivery
- (k) Requirements for inspection of preservation, packaging, and packing

6.4 The attention of design engineers and contractors is invited to the items listed below which require approval of the procuring activity or using service concerned:

- (a) Use of nonstandard parts
- (b) Deviations affecting interchangeability
- (c) Use of contractor's specifications
- (d) Certification of processes
- (e) Fungus-proofing by overall spraying
- (f) Use of special test equipment
- (g) Use of special tools
- (h) Radio-interference in excess of specified limits
- (i) Nameplates
- (j) Nomenclature
- (k) Serial Numbers
- (l) Model specification

- (m) Microfilm of engineering drawings and related data, and Electronic Accounting Machine cards.
- (n) Report of preproduction or design approval tests.
- (o) Report of substantiation parts list and tests
- (p) Test procedures

6.5 Definitions - For the purposes of this specification the definitions of the following terms shall apply.

6.5.1 Launching equipment - This term is intended to be comprehensive and includes equipment, components thereof, and accessories thereto, used to suspend and launch missiles, sonobuoys, bombs, marine location markers, rockets, aircraft parachute flares, torpedoes, underwater sound signals, aircraft depth bombs, bathythermographs, and depth charges. This term also covers items of equipment used in the release control system for the launching equipment but does not cover items of equipment used to compute the launching point.

6.5.2 Interchangeability - This term is intended to describe parts which can be replaced in the launching equipment with like parts having the same characteristics. In the removal and installation of interchangeable parts no modifications shall be required of the launching equipment or the part and the characteristics of the launching equipment shall not be affected with respect to installation, weight, strength, or performance.

6.5.3 Mean-Time-Between-Failures - The mean-time-between-failures shall be the total number of rounds launched divided by the total count of equipment failures in addition to the definition in Specification MIL-R-22973.

NOTICE - When Government drawings, specifications, or other data are used for any purpose other than in connection with a definitely related Government procurement operation, the United States Government thereby incurs no responsibility nor any obligation whatsoever; and the fact that the Government may have formulated, furnished or in any way supplied the said drawings, specifications or other data is not to be regarded by implication or otherwise as in any manner licensing the holder or any other person or corporation, or conveying any rights or permission to manufacture, use or sell any patented invention that may in any way be related thereto.