MILITARY SPECIFICATION

LAUNCHER, ROCKET, LAU-61C/A THERMAL PROTECTED AND LAU-68D/A THERMAL PROTECTED

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 establishes the requirements for manufacture acceptance of the LAU-61C/A and LAU-68D/A Thermal Protected Rocket Launcher, referred to herein as the launcher.

1.2 Classification. The launchers covered by this specification are classified as follows:

Type 1: LAU-61C/A - carries 19 rockets
Type II: LAU-68D/A - carries seven rockets

2. APPLICABLE DOCUMENTS

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commanding Officer, Naval Air Engineering Center, Systems Engineering and Standardization Department (SESD) Code 93, Lakehurst, New Jersey 08733, by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

FSC 1055

2.1 Government documents.

2.1.1 Specifications, standards, and handbooks. Unless otherwise specified, the following specifications and standards of the issue listed in that issue of the Department of Defense Index of Specifications and Standards (DoDISS) specified in the solicitation form a part of this specification to the extent specified herein.

SPECIFICATIONS

MILITARY

MIL-P-116	Preservation, Methods of
MIL-N-18307	Nomenclature and Identification for Electronic, Aeronautical, and Aeronautical Support Equipment, Including Ground Support Equipment
MIL-s-45743	Soldering, Manual Type, High Reliability, Electrical and Electronic Equipment

UNITED STATES ARMY MISSILE COMMAND

MIS-23156	Intervalometer, 2.75-Inch Rocket Launcher

STANDARDS

MILITARY

MIL-STD-109	Quality Assurance Terms and Definitions
MIL-STD-129	Marking for Shipping and Storage
MIL-STD-143	Specifications and Standards, Order of Precedence for the Selection of
MIL-STD-454	Standard General Requirements for Electronic Equipment
MIL-STD-810	Environmental Test Methods
MIL-STD-889	Dissimilar Metals
MIL-STD-1648	Criteria and Test Procedures for Ordnance Exposed to an Aircraft Fuel Fire

2.1.2 Other Government documents, drawings, and publications. The following Government drawings and publications form a part of this specification. to-the extent specified herein.

PUBLICATIONS

NAVAL AIR SYSTEMS COMMAND
(Code Ident 30003)

WR-54	Palletizing Fleet Issue Unit Loads of Weapon Components
WR-54/174	Palletizing Fleet Issue Unit Load Rocket Launcher, LAU-61/A, LAU-68/A or LAU-69/A in Pallet Loading and Storage, MHU 108/E

DRAWINGS

NAVAL AIR SYSTEMS COMMAND
(Code Ident 30003)

DL 958AS120	Launcher, LAU-61C/A Shipping and Flight Configuration
DL 958AS150	Launcher, LAU-68D/A Shipping and Flight Configuration

(Copies of specifications, standards, handbooks, drawings, and publications required by manufacturers in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting officer.)

2.1.3 Order of precedence. In the event of a conflict between the text of this specification and the references cited herein, the text of this specification shall take precedence.

3. REQUIREMENTS

3.1 First article. When specified, a sample shall be subjected to first article InspectIon rsee 4.4 and 6.4).

3.2 Design and construction. The launcher shall be fabricated and assembled in accordance with the drawings, parts list, and other documents listed on DL 958AS120 for Type I launchers and on DL 958AS150 for Type II launchers.

3.2.1 Materials, processes, and parts. Materials, Processe$, and Parts shall be as spec+fied herein.

3.2.1.1 Dissimilar metals. Unless suitably protected against electrolytic corrosion, dissimilar metals shall not be used in intimate contact with each other. Dissimilar metals shall be as defined and classified in MIL-STD-889, and shall be protected in accordance with the requirements of MIL-STD-889.

3.2.1.2 Selection of materials. Specifications and standards for all materials and parts, and Government certification and approval 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.

3.2.1.3 Standard parts. Standard parts (MS, AN, or JAN) shall be used wherever they are suitable for the purpose, and shall be identified on the drawing by their part number. Commercial utility parts such as screws, bo7ts, nuts, cotterpins, etc., may be used provided they possess suitable properties and are replaceable by the standard parts (MS, AN, or JAN) without alteration, and provided the corresponding standard part numbers are referenced in the parts list, and, if practicable, on the contractor's drawings. In the event there are no suitable corresponding standard parts in effect on date of invitation for bids, commercial parts may be used provided they have been certified, accompanied by objective quality evidence (as specified in MIL-STD-109) that the parts meet all the requirements of this specification (see 6.2.2).

3.2.2 Nomenclature and nameplates. Nomenclature assignment and nameplate approval for equipment identification shall be in accordance with MIL-N-18307.

3.2.3 Interchangeability. All parts having the same part number shall be completely interchangeable with each other with respect to installation and performance. Parts joined together by welding or riveting shall be interchangeable as assemblies.

3.2.4 Standards of manufacture. Manufacturing processes and finishes other than shown on applicable drawings shall receive prior approval of the procuring activity by engineering change proposals or by requests for waivers or deviations (see 6.2.2). The responsibility for any malfunction or failure of the component parts or the assembled equipment to pass the requirement test due to fit, proper application or process, clearances, tolerances, or internal stress shall be assumed by the contractor.

3.2.4.1 Painting limitations. Neither primer nor Paint shall be applied to thread, bearing; or working surfaces as' specified on drawings and in specifications.

3.2.5 Service life. Each launcher tube shall be capable of performing as specified herein for not less than 10 firings. In addition, two randomly selected tubes of each designated launcher shall be operated for up to 15 additional firings to demonstrate extended service life.

3.3 Characteristics.

3.3.1 Performance.

3.3.1.1 Insulation resistance. The insulation resistance of the wiring harness after installation in the launcher shall be not less than 20 megohms (Mohms) at 500 +10 Volts direct current (Vdc) from conductor to conductor and conductor to ground.

3.3.1.2 Continuity. The continuity resistance of the MK 40 firing circuit after installation in the launcher shall be not greater than 0.3 ohm. The continuit;f resistance of the MK 66 firing circuit after installation in the launcher shall be not greater than 0.1 ohm. Continuity resistance of any ground circuit shall be not greater than 0.1 ohm.

3.3.1.3 Rocket loading. The launcher shall require not greater than 20 pounds push or pull force exerted on the plug gage. The firing contact shall make sufficient contact with the surface of the rocket igniter contact to transmit a pulse which shall fire a rocket.

3.3.1.4 Detent pull. The detent shall not release before 400 +50, -0 pounds pull force is reached.

3.3.2 Functional.

3.3.2.1 Static firing. With 22.0 +1.0, -0.0 Vdc applied to pin A of J1 or J2 (pin E grounded), the launcher shall ignite all functional rockets, remain intact on the suspension device, and sustain no damage other than darkening of the exposed surfaces. Upon completion of the static firing test, the launcher shall meet the requirements of 3.3.1.1, 3.3.1.2, 3.3.1.3, and 3.3.1.4.

3.3.2.2 Flight firing. During flight firing, the launcher shall ignite all functional rockets, remain intact on the aircraft rack, and sustain no damage other than darkening of the exposed surfaces. Upon completion of the flight firing test, the launcher shall show no evidence of damage or defects, and shall meet the requirements of 3.3.1.1, 3.3.~.2, 3.3.1.3, and 3.3.1.4.

3.4 Environmental conditions. The launcher shall not be damaged, nor shall subsequent performance be degraded, by exposure to any natural combination of service-use environments. These shall include, but shall not be limited to, the following environments.

3.4.1 Temperature shock. The launcher shall perform as specified in 3.3.1.3, 3.3.1.2, 3.3.1.3, and 3.3.1.4 after exposure to the temperature shock test of 4.6.2.1.

3.4.2 Shock. When tested in accordance with 4.6.2.2, the launcher shall withstand a series of three half-sine shock pulses of 10.0 ±0.5 gravity units (g), 60 to 80 milliseconds (ins) duration, applied to the positive and negative vertical axes; and a series of three half-sine shock pulses of 13.5 ±0.5 g, 60 to 80 ms duration, applied to the posftive and negative longitudinal axes. The motors shall not release from the detents, and the intervalometer (MIS-23156) shall not advance during the shock pulses. The launcher shall meet the requirements of 3.3.1.1, 3.3.1.2, 3.3.1.3, and 3.3.1.4 upon completion of the shock test.

3.4.3 Transportation vibration. The palletized launcher shall withstand two 45 ±1 minute sinusoidal excitations, covering the frequency range of five to 200 to five Hertz (Hz) in 15 ±1 minutes at a constant amplitude of 1.5 g peak amplitude (PA), applied to each of the pallet's three axes for a total of six vibrations. The motors shall not release from the detents and the intervalometer shall not advance during the vibrations. The launcher shall meet the requirements of 3.3.1.1, 3.3.1.2, 3.3.1.3, and 3.3.1.4 upon completion of the vibration test.

3.4.4 Fliuht vibration.

3.4.4.1 High speed aircraft. The launcher shall withstand two series of random vibrations, 0.020 ±0.002 gravity units squared per Hz (g^2/Hz) coverfng the frequency range of 10 to 2000 Hz, applied to each of its three axes for a total of six vibrations. The intervalometer shall not advance and electrical continuity between any detent contact arm and pin E of JI or J2 shall be continuous during all vibrations. Within any 10 ms interval there shall be not greater than five ms of cumulative discontinuity. The launcher shall meet the requirements of 3.3.1.1, 3.3.1.2, 3.3.1.3, and 3.3.1.4 upon completion of the vibration test.

3.4.4.2 Helicopter. While being subjected to its respective helicopter flight vfbration test, the intervalometer shall not advance, and electrical continuity between any detent contact arm and pin E of J1 or J2 shall be continuous during all vibrations. Within any 10 ms interval there shall be not greater than five ms of cumulative discontinuity. The launcher shall meet the requirements of 3.3.1.1, 3.3.1.2, 3.3.1.3, and 3.3.1.4 after befng subjected to its respective helicopter flight vibration test, and shall show no evidence of damage or defects.

3.4.5 Salt fog. The launcher shall show no evidence of damage or defects after being subjected to the salt fog test as specified in MIL-STD-81O, Method 509, and shall meet the requirements of 3.3.1.1 and 3.3.1.2 immediately before the test and following a 48-hour drying period after the test.

3.5 Fast cook-off. While the loaded launcher is being subjected to the fast cook-off test as specified in MIL-STD-1648, there shall be no reaction greater than burning from motors, warheads, or fuzes for a period of not less than five minutes.

3.6 Government-furnished equipment. When specified in the contract or purchase order (see 6.2.1), the Government will furnish the contractor with dummy and inert stores to be used for testing the launcher (see 6.3).

3.7 Workmanship. Workmanship practices shall be in accordance with MIL-STD-454, Requirement 9.

3.7.1 Soldering practices. Soldering practices shall be in accordance with MIL-S-45743.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or Purchase order, the contractor is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract or purchase order, the contractor may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. 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.

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

a. First article inspection (see 4.4).
b. Quality conformance inspection (see 4.5).

4.3 Inspection conditions. Unless otherwise specified herein, all inspections shall be performed in accordance with the following test conditions:

a. Temperature: +21.0 +5.5°C (+70 +1O°F).
b. Relative humidity: Not greater Than 80 percent.

4.3.1 Power source. The power source for the static firing test and service life test shall be 22.0 +1.0, -0.0 Vdc and shall be capable of providing not less than three amperes to the launcher connector. This current shall be applied through a 5,0 +0.5 ohm 25 watt resistor.

4.4 First article inspection. The first article inspection shall consist of the contractor's inspection and the Government's inspection. The contractor's inspection shall consist of the tests specified in Table I. The tests of Table I may be conducted in any sequence. The Government's inspection will be performed by a testing facility designated in the contract or purchase order (see 6.2.1). The Government's inspection will consist of the tests specified in Table II. Tests of Table II will be performed in the order listed in Table 11 and in configurations as specified in Table II.

TABLE I. Contractor inspection.

Examination or Test	Requirement Paragraph	Method Paragraph
Insulation resistance	3.3.1.1	4.6.1.1
Continuity	3.3.1.2	4.6.1.2
Rocket loading	3.3.1.3	4.6.1.3
Detent pull	3.3.1.4	4.6.1.4

4.4.1 First article sample. The first article sample shall consist of 10 launchers of the types specified in the contract or purchase order, and five of each type of the following assemblies, subassemblies, and piece parts: Tube assembly, detent assembly, detent housing, launcher tube, retainer, sear, contact spring, and torsion spring. The aforementioned assemblies, subassemblies, -and piece parts will be held by the Government for inspection as deemed necessary by the Government to determine compliance with the requirements of this specification (see 6.2.1). The first article sample shall be martufactured using the same methods, materials, processes, and procedures proposed for production.

4.4.2 First article approval. Approval of the first article shall be by the procuring activity upon satisfactory completion of all tests. The procuring activity reserves the right to require an additional sample and test if any launcher fails to meet any requirement specified herein (see 6.2.1). Any production by the contractor before acceptance of the first article sample shall be at the contractor's risk. Subsequent to first article

TABLE II. Government inspection.

Test 1/2/3/	Paragraph		X	Y	X	Y	X	Y	X	Y	X	Y
	Requirement	Method	1	2	3	4	5	6	7	8	9	10
Temperature shock 4/	3.4.1	4.6.2.1			X	Y			X	Y		
Shock 5/	3.4.2	4.6.2.2							X	Y		
Transportation vibration 10/	3.4.3	4.6.2.3			X	Y			X	Y		
Flight vibration:	3.4.4	4.6.2.4										
High speed aircraft 5/	3.4.4.1	4.6.2.4.1			X	Y						
Helicopter 5/	3.4.4.2	4.6.2.4.2							X	Y		
Salt fog 6/	3.4.5	4.6.2.5							X	Y		
Fast Cookoff 7/	3.5	4.6.2.6	X	Y								
Static firing 8/	3.3.2.1	4.6.3.1			X	Y			X	Y		
Flight firing 9/	3.3.2.2	4.6.3.2					X	Y				
Service Life 8/	3.2.5	4.6.3.3				Y						
Test spares 11/											X	Y

1/ Tests will be performed in listed sequence.
2/ All (X) launchers will be loaded with MK 4/MK 40 Motors until obsolete in Navy inventory, then revert to MK 66 Motors.
3/ All (Y) launchers will be loaded with MK 66 Motors.
4/ With shipping covers and empty.
5/ Without shipping covers and loaded with inert motors with HTUT1/B Warheads.
6/ Hithout shipping covers or fairings and launcher empty.
7/ With forward and aft thermal barriers and loaded with live motors, live M151 Warheads, and live M427 Fuzes or M423 Fuzes.
8/ Without fairings and loaded with live motors and inert warheads.
9/ Loaded with live motors, inert warheads. All firin9s at ambient conditions. One launcher loaded with MK 66 and one with MK 4/MK 40 together or aircraft.
10/ With shipping covers and loaded with inert motors only. Remainder of pallet load will be made up of Government-furnished launchers.
11/ Test spares (launcher samples nine and 10) will be held by the Government for inspection as deemed necessary by the Government to determine compliance with the requirements of this specification.

approval, the contractor shall not change materials, processes, or procedures without prior approval of the procuring activity by engineering change proposals or by requests for waivers or deviations (see 6.2.2). If a break of 12 months or more of continuous production occurs, or if there is a major change in design, a new first article sample and first article inspection shall be required.

4.5 Quality conformance inspection. The quality conformance inspection shall consist of the contractor's inspection and the Government's inspection. The contractor's inspection shall consist of the tests specified in Table I. The tests of Table I may be conducted in any sequence. The Government's inspection will consist of the tests specified in Table III. The quality conformance inspection shall be performed on each inspection lot.

TABLE III. Lot sample inspection.

Test 1/2/3/	Paragraph		X	Y	X	Y
	Requirement	Method	1	2	3	4
Temperature shock 4/	3.4.1	4.6.2.1	X	Y	X	Y
Shock 5/	3.4.2	4.6.2.2			X	Y
Transportation vibration 6/	3.4.3	4.6.2.3	X	Y	X	Y
Flight vibration:	3.4.4	4.6.2.4				
High speed aircraft 5/	3.4.4.1	4.6.2.4.1			X	Y
Helicopter 5/	3.4.4.2	4.6.2.4.2	X	Y		
Static firing 7/	3.3.2.1	4.6.3.1	X	Y		
Fast cook-off 8/	3.5	4.6.2.6			X	Y

1/ Tests will be performed in listed seauence.
2/ All (X) launchers will be loaded with MK 4/MK 40 Motors until obsolete in Navy inventory, then revert to MK 66 Motors.
3/ All (Y) launchers will be loaded with MK 66 Motors.
4/ With shipping covers and empty.
5/ Without shipping covers and loaded with inert motors with blTU-1/B Warheads.
6/ With shipping covers and loaded with inert motors only. Remainder of pallet load will be made up of Government-furnished launchers.
7/ Without fairings and loaded with live motors and inert warheads.
8/ With forward and aft thermal barriers and loaded with live motors, live MIS1 Warheads, and live M427 Fuzes or M423 Fuzes.

4.5.1 Inspection lot. Unless otherwise specified in the contract or purchase order (see 6.2.1), an inspection lot shall contain not less than 250 nor more than 500 launchers of each type being procured. The inspection lot shall be formed from launchers that have passed the inspections of Table I and shall consist of completed launchers fabricated from the same materials, using the same processes and procedures, under the same conditions, and offered for inspection at the same time.

4.5.2 Sampling. A sample of four launchers shall be randomly selected from each inspection lot and forwarded to an independent facility specified in the contract or purchase order (see 6.2.1) for testing. Sample tests shall consist of all tests listed in Table I and Table III. Tests of Table I may be conducted in any sequence. Tests of Table III may be performed in the order listed in Table III and in the configurations as specified in Table III.

4.5.3 Acceptance criteria. If any sample fails to pass the tests specified herein, another random sampling of the same size shall be submitted for testing. Failure of the second sample shall cause the entire lot to be rejected. When specified in the contract or purchase order (see 6.2.1), rejected lots may be reworked and resubmitted for retest upon approval by the procuring activity.

4.5.4 Individual tests. Individual tests shall be performed in accordance with Table I on each launcher submitted for-acceptance under the contract or purchase order. The contractor shall maintain test reports showing the quantitative and qualitative results of individual tests. Such reports shall be signed by an authorized representative of the contractor, and this data shall be made available to the procuring activity upon request (see 6.2.2).

4.6 Test methods.

4.6.1 Individual tests.

4.6.1.1 Insulation resistance. Insulation resistance shall be tested, using a megohmmeter, applying 500 +10 Vdc for not less than five seconds. This test shall be conducted with The intervalometer and safety pin removed. The insulation resistance of the power circuits shall be tested from each receptacle to ground. The insulation resistance of each firing circuit shall be tested from the intervalometer connector to ground. When any firing circuit is tested, all other circuits shall be shorted to the launcher ground. The launcher shall meet the requirements of 3.3.1.1.

4.6.1.2 Continuity. Continuity of the power and firing circuits shall be tested using an ohmmeter connected to each end of the circuit under test. Continuity of each MK 40 firing circuit shall be tested from the intervalometer connector to the end of the corresponding MK 40 Rocket Motor contact

point. This shall be performed with a dummy MK 40 Rocket Motor or equal in the corresponding tube. Continuity of each MK 66 firing circuit shall be tested from the intervalometer connector to the end of the corresponding MK 66 Rocket Motor contact point. This may be performed with a dummy MK 66 Rocket Motor or equal in the corresponding tube. Continuity of the ground circuit shall be tested from each power receptacle to the suspension lug in the hanger beam. With the safety pin inserted, continuity to ground shall be tested from the power pin in the intervalometer connector to the suspension lug in the hanger beam. Continuity of the grounding circuit shall be tested from each ground pin in the intervalometer connector to the suspension lug in the hanger beam. The launcher shall meet the requirements of 3.3.1.2.

4.6.1.3 Rocket loading. A plug gage simulating a rocket shall be inserted from the forward end of the tube to the detent. The plug gage shall be 2.800 +0.002,-0.000 inches in diameter for a length of 42.0 ±0.5 inches and a straightness deviation of not greater than 0.003 inch. The gage shall either be of continuous diameter through the length or a series of gaging surfaces spaced not greater than 6.0 inches apart. The launcher shall meet the requirements of 3.3.1.3.

4.6.1.4 Detent pull. A fixture simulating a 2.75-inch rocket with a groove representing the locking groove on the nozzle and fin assembly shall be inserted into the tube and locked into place by the detent. The fixture shall be pulled forward in such a manner that a load of 400 +50, -O pounds shall be reached in one to two seconds. The launcher shall meet the requirements of 3.3.1.4.

4.6.2 Environmental inspection. All launchers of the first article sample or a randomly selected sample of four launchers from an inspection lot will be subjected to the following environmental tests in accordance with Tables II or III, as applicable.

4.6.2.1 Temperature shock. The launcher will be subjected to a temperature shock test of three complete cycles. The upper temperature extreme will be +60 +3°C (+140 +5°F), and the lower temperature extreme will be -40 ±3°C (-40 +5°F). Each cycle will consist of raising the internal chamber temperature To the upper temperature extreme and maintaining for a period of not less than four hours or until the launcher stabilizes. At the conclusion of this time period, the launcher will be transferred, within five minutes, to a cold chamber with an internal chamber temperature maintained at the lower temperature extreme. The launcher will be exposed to this temperature for a period of not less than four hours or until the launcher stabilizes. To begin the second cycle, the launcher will, within five minutes, be returned to the hiqh temperature chamber maintained at the upper temperature extreme. After th~ee full cycles, the launcher will be returned to standard ambient conditions and stabilized. Upon completion of the test, the tests of 4.6.1.1, 4.6.1.2, 4.6.1.3, and 4.6.1.4 will be performed. The launcher will meet the requirements of 3.3.1.1 through 3.3.1.4.

4.6.2.2 Shock. The launcher will be mounted on a 14-inch suspension bomb rack or simulated bomb rack having 14-inch suspension provisions and subjected to three shocks in each of the positive and negative vertical and longitudinal axes for a total of 12 shocks. The verical half-sine shock pulses will have a peak of 10 +0.5g and a 60 to 80 ms duration. The longitudinal half-sine shock pulses–will have a peak of 13.5 +0.5g and a 60 to 80 ms duration. Calibration of shock producing apparatus w~ll be accomplished by using a dummy test specimen and achieving two consecutive shocks of the required shape, amplitude, and duration. The applied shock will be measured midway between the attachment lugs on the bomb rack using an accelerometer with a flat frequency response within +10 percent from two to 20 Hz. The accelerometer will have a transverse s~nsitivity of not greater than five percent, and an amplitude linearity within 10 percent from five to 100 percent of the peak acceleration amplitude. The shock analysis system employed will not allow more than a five percent measurement error into the frequency band of two to 20 Hz. If filters are used, they will have linear phase shift characteristics and a pass band within one decibel from two to 20 Hz. The tests will be performed with the intervalometer in the armed position with no power applied. The intervalometer index position will be noted before and after each test. The launcher will meet the requirements of 3.4.2. Upon completion of the shock test, the tests of 4.6.1.1, 4.6.1.2, 4.6.1.3, and 4.6.1.4 will be performed. The launcher will meet the requirements of 3.3.1.1 through 3.3.1.4.

4.6.2.3 Transportation vibration. The launchers (which will include the number of test samples shown in Table II or III, as applicable) will be palletized in accordance with WR-54/174. The pallet will be vibrated along each of its three axes for 45 +1 minutes of sinusoidal excitation covering the frequency range of five to 200 to five Hz in 15 ±1 minutes at a constant amplitude of 1.5 g PA. The series of tests will be run once with the launchers at +60 ±3°C (+140 ±5°F) and once with launchers at -40 ±3°C (-40 ±5°F). Total time of vibration will be not less than 4.5 hours: The intervalometer index position will be noted before and after the test. The launcher will meet the requirements of 3.4.3. Upon completion of the test, each launcher will be subjected to the tests of 4.6.1.1, 4.6.1.2, 4.6.1.3, and 4.6.1.4. The launcher will meet the requirements of 3.3.1.1 through 3.3.1.4.

4.6.2.4 Flight vibration. The launcher will be mounted on a 14-inch suspension bomb rack or simulated bomb rack having 14-inch suspension provisions and subjected to the following two tests as-specified in 4.6.2.4.1 and 4.6.2.4.2 in accordance with Tables II or III, as applicable. Electrical contact between any detent contact arm and pin E of J1 or J2 will be continuously monitored during the test. The intervalometer index position will be noted before and after the test. The launcher will meet the requirements of 3.4,4.1 and 3.4.4.2. Upon completion of the test, the launcher will be subjected to the tests of 4.6.1.1, 4.6.1.2, 4.6.1.3, and 4.6.1.4. The launcher will meet the requirements of 3.3.1.1 through 3.3.1.4.

TABLE IV . Helicopter valibration test.

Launcher type/ axis	30 ±1 minute sinusoidal sweep (30 minutes, 5-500-5Hz)	30 minute resonant dwells
Type I/ Longitudinal	0.40 ±0.04 inch double amplitude (DA) from 5 to 7 Hz, 1.0 g PA from 7 to 33 Hz, 0.0180 ±0.0018 inch DA from 33 to 48 Hz, and 2.0 ±0.2 g PA from 48 to 500 Hz	1.1 g PA at 11.0 ±1.1 Hz 0.8 g PA at 22.0 ±2.2 Hz 0.6 g PA at 33.0 ±3.3 Hz 0.5 g PA at 44.0 ±4.4 Hz
Type I/ Transverse	0.40 ±0.04 inch DA from 5 to 7 Hz, 1.0 g PA from 7 to 18 Hz, 0.060 ±0.006 inch DA from 18 to 26 Hz, and 2.0 ±0.2 g PA from 26 to 500 Hz	1.2 g PA at 11.0 ±1.1 Hz 1.0 g PA at 22.0 ±2.2 Hz 0.5 g PA at 33.0 ±3.3 Hz 0.5 g PA at 44.0 ±4.4 Hz
Type I/ Vertical	0.40 ±0.04 inch DA from 5 to 10 Hz and 2.0 ±0.2 g PA from 10 to 500 Hz	2.6 g PA at 11.0 ±1.1 Hz 1.5 g PA at 22.0 ±2.2 Hz 0.5 g PA at 33.0 ±3.3 Hz 0.6 g PA at 44.0 ±4.4 Hz
Type II/ Longitudinal	Same as Type I	1.2 g PA at 11.0 ±1.1 Hz 1.1 g PA at 22.0 ±2.2 Hz 1.2 g PA at 33.0 ±3.3 Hz 0.8 g PA at 44.0 ±4.4 Hz
Type II/ Transverse	Same as Type I	1.2 g PA at 11.0 ±1.1 Hz 1.8 g PA at 22.0 ±2.2 Hz 1.5 g PA at 33.0 ±3.3 Hz 0.9 g PA at 44.0 ±4.4 Hz
Type II/ Vertical	Same as Type I	2.9 g PA at 11.0 ±1.1 Hz 2.7 g PA at 22.0 ±2.2 Hz 1.2 g PA at 33.0 ±3.3 Hz 1.5 g PA at 44.0 ±4.4 Hz

4.6.2.4.1 High speed aircraft. The launcher shall be vibrated along each of its three axes for 45 +1 minutes of random excitation of 0.020 +0.002 g^2/Hz covering the frequency range of 10 to 2000 Hz. The series will be run once with the launcher at +60 +3°C (+140 +5°F) and once with the launcher at -40 +3°C (-40 +5°F). Total vibration time–will be not less-than 4.5 hours. An accelerometer will be attached to the launcher aft bulkhead with its sensitive axis parallel to the direction of the input vibration to measure the response of the bulkhead. The vibration input to the suspension bomb rack will be reduced in amplitude over those frequencies whe ein the response accelerometer is indicating an amplitude in excess of 0.04 g^2/Hz. The response amplitude of the aft bulkhead in these areas of frequency will then be maintained at 0.02 g^3/Hz +3 decibels.

4.6.2.4.2 Helicopter. The launcher, at +22.8 ~10.0°C (+73 ±18°F), will be vibrated in accordance with Table IV.

4.6.2.5 Salt fog. To ensure compliance with the requirements of 3.4.5, the launcher will be tested in accordance with MIL-STD-81O, Method 509. Immediately before the test and following a 48-hour drying period after the test, the launcher will be subjected to the tests of 4.6.1.1 and 4.6.1.2. The launcher will meet the requirements of 3.3.1.1 and 3.3.1.2.

4.6.2.6 Fast cook-off. The loaded launcher will be tested in accordance with MIL-STD-1648, except the requirement for sound over pressure level measurement will be eliminated. The launcher will meet the requirements of 3.5.

4.6.3 Functional.

4.6.3.1 Static firing. The launcher will be suspended from a bomb rack *or* simulated bomb rack having 14-inch suspension provisions and test fired. The potential at the launcher connector will be 22.0 +1.0, -0.0 Vdc and the current will be not less than three amperes. There will be a 5.0 +0.5 ohm 25 watt limiting resistor in series with the launcher intervalometer. The firing sequence will consist of two firings of each designated launcher: One single mode firing followed by one ripple mode firing. During single mode firing, no rocket will be fired within 60 seconds of firing the previous rocket. The launcher will meet the requirements of 3.3.2.2. Upon completion of the static firing, the launcher will be subjected to the tests of 4.6.1.1, 4.6.1.2, 4.6.1.3, and 4.6.1.4. The launcher will meet the requirements of 3.3,1.1 through 3.3.1.4.

4.6.3.2 Flight firing. Launchers will be installed on a military high speed aircraft and/or a military helicopter and fired using a simulated combat flight profile. The launchers will be flown, fired in ripple mode, reloaded, flown, and fired out in single mode. Upon completion of the flight firing, the launchers will be visually inspected for damage and defects. The launchers

will meet the requirements of 3.3.2.3. Upon completion of the flight firing, the tests of 4.6.1.1, 4.6.1.2, 4.6.1.3, and 4.6.1.4 will be performed on both launchers. The launchers will meet the requirements of 3.3.1.1 through 3.3.1.4.

4.6.3.3 Service life. One launcher that has successfully completed the static firing test will be further tested for service life. The launcher will be suspended from a bomb rack or simulated bomb rack having 14-inch suspension provisions and test fired. The potential at the launcher connector will be 22.0 +1.0, -0.0 Vdc. There will be a 5.0 ±0.5 ohm 25 watt limiting resistor in sertes with the launcher intervalometer. The firing sequence will consist of firing the launcher eight times (seven single mode firings followed by one ripple mode firing) plus single firing two tubes of the launcher 15 additional times to total 23 firings (25 firings including the MO firings of the static firing test).

4.6.4 Packaging inspection. Prior to shipment, the launcher shall be inspected by the contractor for conformance to the requirements of Section 5.

5. PACKAGING

5.1 Preservation, packaging, and packing. The level of preservation, packaging, and packing shall be level A or C as specified in the contract or purchase order (see 6.2.1).

5.1.1 Level A. If the contract or purchase order specifies level A, each launcher shall be preserved and packaged in accordance with MIL-P-116, Method II.

5.1.2 Level C. When level C is specified, each launcher shall be preserved and packaged in accordance with the manufacturer's best commercial practice. It shall be the responsibility of the contractor to afford a level of protection adequate to prevent damage to the launcher during transit from the contractor's plant to the first destination.

5.1.3 Packing.

5.1.3.1 Level A. When level A packing is specified, each launcher shall be packed in overseas containers conforming to WR-54/174. These containers shall be palletized in accordance with the general requirements of MR-54. There shall be not less than four containers in a palletized load.

5.1.3.2 Level C. When level C packing is specified each launcher shall be packed in containers acceptable by the common carrier which will ensure safe delivery at the lowest rate to the point of delivery. Containers shall comply with the carrier's rules and regulations applicable to the mode of transportation.

5.2 Marking. All marking for interior and exterior containers shall conform to MIL-STD-129 and shall include the following:

a. Launcher, rocket LAU-61C/A or LAU-68D/A, whichever is appropriate.
b. Name of supplier (and manufacturer if not the same).
c. Date of preservation.
d. Specification number.
e. Contract number.
f. Lot number.
g. Weight.

6. NOTES

6.1 Intended use. The rocket launchers covered by this specification are intended for use as domestic and overseas shipping containers for 2.75-inch aircraft rockets and for service launching of 2.75-inch aircraft rockets.

6.2 Ordering data.

6.2.1 Acquisition requirements. Acquisition documents should specify the following:

a. Title, number, and date of this specification.
b. Government-furnished equipment, if required (see 3.6).
c. designated testing facility (see 4.4. and 4.5.2).
d. Rework of rejected lots (see 4.5.3).
e. Type of launchers, assemblies, subassemblies, and piece parts for first article inspection (see 4.4.1).
f. Additional samples and tests, if required (see 4.4.2).
g. Inspection lot size, if different than specified (see 4.5.1).
h. Level of preservation, packaging, and packing (see 5.1).

6.2.2 Data requirements. ilhen this specification is used in an acquisition which incorporates a DO Form 1423, Contract Data Requirements List (CDRL), the data requirements identified below shall be developed as specified by an approved Data Item Description (DD Form 1664) and delivered in accordance with the approved CDRL incorporated into the contract. When the provisons of DAR 7-104.9(n)(2) are invoked and the DD Form 1423 is not used, the data specified below shall be delivered by the contractor in accordance with the contract or purchase order requirements. Deliverable data required by this specification is cited in the following paragraphs.

Paragraph No.	Data Requirement Title	DID No.
(a) 3.2.1.3	Nonstandard Part Approval Requests/Proposed Additions to an Approved Program Parts Selection List	DI-E-7028A
(b) 3.2.4, 4.4.2	Engineering Change Proposals (ECps), Request for Waivers and Deviations (Long Form)	DI-E-2037
(c) 4.5.4	Test and Demonstration Reports	DI-T-1906

(Copies of DIDs required by contractors in connection with specific acquisition functions should be obtained from the Naval Publications and Forms Center or as directed by the contracting officer.)

6.3 Government-furnished property. The contracting officer should arrange to furnish the property listed in 3.6.

6.4 First article. When a first article inspection is required, the item will be tested and should be a first article sample. The first article should consist of 10 launchers of the type specified in the contract or purchase order plus additional assemblies, subassemblies, and piece parts as specified in 4.4.1. The contracting officer should include specific instructions in acquisition documents regarding arrangements for examinations, test, and approval of the first article sample.

6.5 Disposition of test samples. First article and quality conformance test samples procured under this specification should be considered to be destructively tested and therefore should not be included in net deliverable launchers.

Preparing activity:

Navy - AS

(Project 1055-N074)

INSTRUCTIONS: In a continuing effort to make our standardization documents better, the DoD provides this form for use in submitting comments and suggestions for improvements. All users of military standardization documents are invited to provide suggestions. This form may be detached, folded along the lines indicated, taped along the loose edge *(DO NOT STAPLE)*, and mailed. In block 5, be as specific as possible about particular problem areas such as wording which required interpretation, was too rigid, restrictive, loose, ambiguous, or was incompatible, and give proposed wording changes which would alleviate the problems. Enter in block 6 any remarks not related to a specific paragraph of the document. If block 7 is filled out, an acknowledgement will be mailed to you within 30 days to let you know that your comments were received and are being considered.

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STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

(See Instructions – Reverse Side)

1. DOCUMENT NUMBER	2. DOCUMENT TITLE
MIL-L-85520(AS)	LAUNCHER, POCKET, LAU-61C/A THERMAL PROTECTED AND LAU-68D/A THERMAL PROTECTED

3a. NAME OF SUBMITTING ORGANIZATION	4. TYPE OF ORGANIZATION *(Mark one)*
	☐ VENDOR ☐ USER ☐ MANUFACTURER ☐ OTHER *(Specify)*:
b. ADDRESS *(Street, City, State, ZIP Code)*	

5. PROBLEM AREAS

a. Paragraph Number and Wording:

b. Recommended Wording:

c. Reason/Rationale for Recommendation:

6. REMARKS

7a. NAME OF SUBMITTER *(Last, First, MI)* – Optional	b. WORK TELEPHONE NUMBER *(Include Area Code)* – Optional
c. MAILING ADDRESS *(Street, City, State, ZIP Code)* – Optional	8. DATE OF SUBMISSION *(YYMMDD)*

DD FORM 82 MAR 1426

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