

MIL-C-82662(OS)
31 January 1977

MILITARY SPECIFICATION
CATAPULT, AIRCRAFT EJECTION SEAT
CKU-5/A ASSEMBLY

This specification is approved for use by the Naval Sea 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 the minimum requirements for the procurement of the Rocket Catapult CKU-5/A loaded assembly.

2. APPLICABLE DOCUMENTS

2.1 Issues of documents. The following documents of the issue in effect on the date of invitation for bids or request for proposal, form a part of this specification to the extent specified herein.

SPECIFICATIONS

Military

MIL-P-116	Preservation-Packaging, Methods of
MIL-I-6866	Inspection, Penetrant Method of
MIL-I-6868	Inspection Process, Magnetic Particle
MIL-S-9479	Seat System, Upward Ejection, Aircraft, General Specification for
MIL-P-82663	Propellant, Solid, Composite

STANDARDS

Military

MIL-STD-105	Sampling Procedures and Tables for Inspection by Attributes
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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 Ordnance Station (611), Indian Head, MD 20640, by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

FSC 1377

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MIL-STD-129	Marking for Shipping and Storage
MIL-STD-414	Sampling Procedures for Inspection by Variables
MIL-STD-453	Inspection, Radiographic
MIL-STD-810	Environmental Test Methods
MS17983	Compass-Magnetic, Pilots Standby

PUBLICATIONS

Naval Sea Systems Command (Code 10001)

WR-43	Preparation of Quality Assurance Provisions
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DRAWINGS

Naval Ordnance Station, Indian Head (Code Ident 14083)

11726650	Tube, Motor
11726655	Tube, Launcher
11726656	Tube, Booster
11740613	Shear Pin
11743975	Catapult, Aircraft Ejection Seat CKU-5/A Assembly
11743980	Breech Assembly
11820861	Box Packing, Catapult, Aircraft Ejection Seat CKU-5/A
11820862	Box, Fiberboard (Inner) Packing Catapult Aircraft Ejection Seat CKU-5/A

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

2.2 Other Publications - The following documents form a part of this specification to the extent specified herein. Unless otherwise indicated, the issue in effect on the date of invitation for bids or request for proposal shall apply.

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CODE OF FEDERAL REGULATIONS

49 CFR 100-199

Transportation

(The Code of Federal Regulations is available from the Superintendent of Documents, U. S. Government Printing Office, Washington, D.C. 20462. Orders should specify "49 CFR 100-199 (latest revision)").

NATIONAL MOTOR FREIGHT TRAFFIC ASSOCIATION, INC., AGENT
National Motor Freight Classification

(Application for copies should be addressed to American Trucking Associations, Attn: Tariff Order Section, 1616 P Street, Washington, DC 20036.)

UNIFORM CLASSIFICATION COMMITTEE, AGENT
Uniform Freight Classification

Application for copies should be addressed to the Uniform Classification Committee, Room 1106, 222 South Riverside Plaza, Chicago, IL 60606.

3. REQUIREMENTS

3.1 First article. Unless otherwise specified in the contract or order (see 6.2), first article samples of the catapult assemblies are required and shall be manufactured using the methods and procedures proposed for production. The samples shall be tested as specified in Section 4 for the purposes of determining, prior to starting production, that the contractor's production methods are capable of producing catapult assemblies that comply with the technical requirements of the contract (see 4.4).

3.1.1 Pressure transducers. All first article sample catapult assemblies shall be adapted for pressure transducers as specified in the contract or order (see 6.2).

3.2 Materials. All materials, parts and assemblies shall be in accordance with the applicable drawings, this specification and the documents referenced herein.

3.3 Age.

3.3.1 Explosive components. All explosive components, including but not limited to, ignition powders, primers and igniters, shall be manufactured within the 12 months prior to the contract scheduled delivery date for the catapult assemblies lot.

3.3.2 Propellant. The propellant shall be manufactured within the 150 days prior to the contract scheduled delivery date for the catapult assemblies lot.

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3.4 Performance and product characteristics. The rocket catapults shall meet the following performance and product characteristics when test fired at -65°F, +70°F and +165°F using an ejected weight of 375 pounds.

3.4.1 Ballistic. The rocket catapults shall meet the ballistic performance parameters specified in Table I.

3.4.1.1 Other requirements. In addition to meeting the ballistic requirements, none of the following shall occur during test firing of the rocket catapults:

- (a) No unit component, including but not limited to cartridge components, O-rings, springs or pieces of propellant shall be ejected.
- (b) No component subject to loading shall fail.
- (c) No abnormal nozzle erosion, hot spots or burn through shall occur.

TABLE I. Ballistic Performance Requirements - 375 Pound ejected weight

	PARAMETER	-65°F		70°F		165°F		AQL
		MIN	MAX	MIN	MAX	MIN	MAX	
Catapult	Dynamic Response Index (DRI) #	-	-	-	18.0	-	22.0	.65
	Separation Velocity (ft/s)	35	-	40	-	45	-	1.0
	Ignition Delay (ms)	-	30	-	30	-	30	.65
	Axial Thrust (lb _f)	-	7,000	-	7,000	-	7,000	1.0
Rocket Motor	Resultant Impulse (lb _f -sec)	950	-	950	-	950	-	1.0
	Ignition Delay (ms)	-	50	-	50	-	50	1.0
	Action Time (ms)	-	500	-	450	-	400	1.0
	Resultant Thrust (lb _f)	-	5000	-	5000	-	5000	.65
	Thrust Angle (reference)	58°*		58°*		58°*		-

*Record for information only

#DRI is defined in MIL-S-9479 (see 6.4.7)

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3.4.2 Initiation. All rocket catapults shall be capable of firing with any actuating gas pressure up to 10,000 psia.

3.5 Hydrostatic pressure. The components listed in TABLE II shall be capable of withstanding the applicable internal hydrostatic pressure specified in TABLE II for 15 seconds (s) minimum when tested in accordance with 4.5.6.2.

TABLE II. Hydrostatic pressure requirements.

COMPONENT	DRAWING	HYDROSTATIC PRESSURE (PSI)
Motor Tube	11726650	5,000
Launcher Tube	11726655	12,000
Booster Tube	11726656	12,000
Breech Assembly	11743980	12,000

3.6 Shear pin strength. Each lot of shear pins (drawing 11740613) shall be tested in accordance with 4.5.7. Shear pins shall shear when subjected to a load of 41 ± 5 lbs applied at the rate of 0.125 inches per minute.

3.7 Radiographic requirements. Each loaded rocket catapult shall conform to the radiographic requirements of MIL-STD-453, radiographic quality level 1.

3.8 Torque. The booster tube and breech assembly, when seated with a torque of $400 + 50, -0$ inch-pounds, shall not be loosened or deformed when subjected to a breakaway torque of 200 inch-pounds.

3.9 Protective finish. Protective finish shall be in accordance with the applicable specifications and drawings and shall apply to all surfaces of the component regardless of contour configuration.

3.10 Residual magnetism. The rocket catapult assembly, when passed 6 inches in front of the compass along the entire length of the catapult (see FIGURE 1), shall not cause the indicator of a compass in accordance with MS17983 to deflect more than 5° in either direction.

3.11 Environmental requirements. The rocket catapult assemblies shall show no evidence of disintegration of propellant or derangement of components and shall be capable of meeting the performance and product characteristics requirements of 3.4 when test fired in accordance with 4.4.2 after exposure to the following environmental conditions.

3.11.1 High temperature. The rocket catapult shall be capable of withstanding the high temperature test of 4.4.1.1.

3.11.2 Vibration. The rocket catapult shall be capable of withstanding the vibration test of 4.4.1.2.

3.11.3 Temperature-shock. The rocket catapult shall be capable of withstanding the temperature-shock test of 4.4.1.3.

3.12 Propellant. The propellant shall be in accordance with MIL-P-82663.

3.13 Identification marking. Each rocket catapult shall be marked in accordance with drawing 11743975 with an identification label, a warning label, and an installation label.

3.13.1 Lot designation. The following lot designation system shall be used for identification marking of each rocket catapult assembly:

aa-xxx-cccc

where:

aa = the cumulative total of lots produced by one supplier

xxx = the letter designation (abbreviation) of the supplier

cccc = the month and year of the manufacture of the oldest propellant batch used in the rocket catapult lot

3.14 Workmanship. The requirements for workmanship shall be as specified in the applicable drawings, referenced specifications and the following:

3.14.1 Metal defects. All components shall be free of cracks, splits, cold shots, inclusions, porosity or any similar defect.

3.14.2 Burr. No part shall have a burr which might interfere with the assembly or function of the item or which might be injurious to personnel handling the item.

3.14.3 Foreign matter. No part of the assembly shall contain chips, dirt, grease, rust, corrosion or other foreign material.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract, the contractor is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract, the contractor may use his 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 inspection. The inspection requirements specified herein are classified as follows:

a. First article inspection (see 4.4)

b. Quality conformance inspection (see 4.5)

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4.3 Inspection conditions. Unless otherwise specified (see 6.2), all inspections shall be performed under the following conditions:

- a. Temperature: Room ambient 18 to 35°C (65 to 95°F)
- b. Altitude: Normal ground
- c. Vibration: None
- d. Humidity: Room ambient to 95 percent relative, maximum

4.4 First article inspection. Unless otherwise specified in the contract or order (see 6.2), a first article sample of 12 loaded rocket catapult assemblies, manufactured in accordance with 3.1, shall be submitted to the Naval Ordnance Station, Indian Head, Maryland 20640 for first article inspection. The first article samples shall be subjected to the quality conformance inspection of 4.5 with the exception of the test firing of 4.5.5 followed by environmental testing, radiographic examinations and static firing in the sequence specified in TABLE III. Acceptance of the first article sample shall be based on no defects in the sample. Any production of the rocket catapult assemblies by the contractor, prior to approval of the first article sample, shall be at the contractors risk. First article samples shall not be included as a part of the quantity specified for delivery in the contract (see 6.2).

4.4.1 Environmental tests.

4.4.1.1 High temperature. The rocket catapult assembly shall be subjected to a high temperature test in accordance with Procedure I of method 501.1 of MIL-STD-810 with the exception that the test item shall be maintained at 165°F for 50 hours minimum.

4.4.1.2 Vibration. The rocket catapult assembly shall be subjected to random vibration in accordance with procedure IA of Method 514.2 of MIL-STD-810 for 6 hours with 2 hours on each axis. Before vibration, units shall be temperature conditioned in accordance with TABLE III. The input vibratory acceleration shall be in accordance with curve A of Figure 514.2 - 2A with a W_0 factor of $.1 G^2/Hz$. If the rocket catapult must be removed from the environmental conditioning chamber or if the temperature falls outside the specified temperature limits for a period of more than 5 minutes, the testing shall be stopped and the unit shall be reconditioned. A reconditioning time of 2 minutes for every minute the unit is outside the specified temperature envelope shall be required. A continuous temperature history of the unit shall be kept for all conditioning and testing time. Unless otherwise noted, the rocket catapult shall be mounted on a test fixture in a manner that will simulate actual seat/aircraft installation and excited through the attachment fittings. In addition to compliance with the random vibration test of Method 514.2, the rocket catapult shall comply with the gun fire vibration test of Method 519.2 for those applications whereby guns are installed on the aircraft (see 6.2). However, if the maximum test spectrum level of the gunfire configuration is determined to be equal to or less than the vibration test level of Method 514.2, the gun fire vibration test shall not be required.

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TABLE III. First Article Evaluation Test Program. *

TEST PARA.	TEST	UNIT NUMBER											
		1	2	3	4	5	6	7	8	9	10	11	12
4.5.6.1	Radiographic Inspection	a	a	a	a	a	a	a	a	a	a	a	a
4.4.1.1	High Temperature	b	b	b	b	b	b						
4.4.1.2	Vibration -65°F										b	b	b
4.4.1.2	Vibration +165°F							b	b	b			
4.5.6.1	Radiographic Inspection	c	c	c	c	c	c	c	c	c	c	c	c
4.4.1.3	Temperature Shock	d	d	d	d	d	d	d	d	d	d	d	d
4.5.6.1	Radiographic Inspection	e	e	e	e	e	e	e	e	e	e	e	e
4.4.2	Static Firing -65°F	f	f					f	f				
4.4.2	Static Firing +70°F			f	f					f	f		
4.4.2	Static Firing +165°F					f	f					f	f

* Letters denote sequence of testing

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4.4.1.3 Temperature shock. The rocket catapult assembly shall be subjected to a temperature shock test in accordance with procedure I of method 503.1 of MIL-STD-810 with the exception that the duration of each cycle shall be 8 hours.

4.4.2 Static firing test. Within 30 days after completion of environmental exposure, the rocket catapults shall be static fired at the Naval Ordnance Station, Indian Head, Maryland 20640. The sample shall be temperature conditioned per Table III for a minimum of 8 hours and test fired within 10 minutes after removal from the conditioning chamber to verify conformance to the requirements of 3.4. Data specified in Table I, shall be analyzed in accordance with MIL-STD-414. Non conformance with Table I, or any requirement of 3.4.1, shall be cause for rejection of the first article sample.

4.5 Quality conformance inspection. The quality conformance inspection shall consist of the examinations and tests of 4.5.4 thru 4.5.7 conducted on samples selected as specified in 4.5.2. The shear pin test of 4.5.7 shall be performed prior to installation of any shear pins from the lot in question into rocket catapult assemblies. The contractor is responsible for assuring that all rocket catapults offered for acceptance meet all the requirements of the applicable drawings and specifications. Items of inspection shall be serialized and inspection data traceable to a specific serial number.

4.5.1 Test reports. When specified in the contract or order (see 6.2), the contractor shall furnish test reports to the procuring activity. Test reports shall include the following information:

- a. Propellant description (see 3.12 and 6.3.1)
- b. Static firing performance test results (see 4.5.5 and 6.3.2).
- c. Summary sheet (see 6.3.3).
- d. Ammunition data cards (see 6.3.4).
- e. Propellant/assembly production records (see 6.3.5)
- f. Certification of age of explosive components and propellant (see 3.3).

4.5.2 Sampling for quality conformance inspection.

4.5.2.1 Lot. For the purposes of identification, inspection, and shipment, a lot of loaded assemblies shall consist of 360 assemblies, maximum, inclusive of test samples. The homogeneity of inspection lots shall be retained as follows:

- a. Components were produced by homogeneous process
- b. Units are loaded with same lot of rocket motors (see 6.4.10).

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4.5.2.2 Sampling for examination. Designation of defects (critical, major, and minor) shall be in accordance with WR-43.

- a. Critical and major defects: Each rocket catapult assembly shall be examined for all critical and major defects.
- b. Minor Defects: Samples for examination shall be selected in accordance with inspection level II of MIL-STD-105.

4.5.2.3 Sampling for static firing test. A sample of 21 loaded rocket catapult assemblies shall be submitted to the Naval Ordnance Station, Indian Head, Maryland 20640, for static firing in accordance with 4.5.5. Loaded rocket catapult samples shall not be preselected during production. Rocket catapults selected for samples shall not be included as a part of the quantity specified for delivery in the contract or order. Only primary components from a single primary component lot shall be used in a production lot of loaded rocket catapults. One primary component lot may be used in more than one loaded rocket catapult production lot. The ballistic sample size shall be divided as equally as possible among rocket motor batches. From each rocket motor batch not represented in the 21 sample rocket catapult assemblies, one sample rocket motor shall be selected for static firing by the contractor (see 4.5.5.1), so that at least one rocket motor from each rocket motor batch has been static fired.

4.5.2.4 Sampling for non-destructive test. Each rocket catapult assembly shall be subjected to the tests specified in 4.5.6.

4.5.2.5 Sampling for shear pin test. A sample of 50 shear pins from each shear pin lot shall be subjected to the shear pin strength test of 4.5.7.

4.5.3 Resubmission of rejected lot. A sample of 42 rocket catapult assemblies shall be selected in accordance with 4.5.2.3 and submitted when, with prior approval of the procuring activity, the contractor requests that the rejected lot be test fired under different conditions or the contractor believes a rejected lot may be reworked to meet the requirements of this specification.

4.5.4 Examination.

4.5.4.1 Critical and major defects. Each rocket catapult assembly shall be visually examined for critical and major defects specified in 4.5.2.2 and the applicable drawings. Any rocket catapult assembly found to contain a critical or major defect shall be rejected.

4.5.4.2 Minor defects. Sample rocket catapult assemblies selected in accordance with 4.5.2.2.b shall be examined for minor defects in accordance with the applicable drawings, 3.9, 3.13 and 3.14. The acceptable quality level (AQL) shall be 2.5 defects per hundred units.

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4.5.5 Static firing test. Rocket catapults selected in accordance with 4.5.2.3 shall be static fired at the Naval Ordnance Station, Indian Head, Maryland 20640 within 30 days after submission for acceptance of the rocket catapult lot. The sample catapults shall be divided into 3 equal groups and one group conditioned at each temperature specified in TABLE I for a minimum of 8 hours and static fired within 10 minutes after removal from the conditioning chamber. Data specified in TABLE I shall be analyzed in accordance with MIL-STD-414. Nonconformance with TABLE I, or any requirement of 3.4.1, shall be cause for rejection of the lot.

4.5.5.1 Contractor static firing test. Sample rocket motors selected by the contractor in accordance with 4.5.2.3 shall be static fired by the contractor as rocket motor batch acceptance tests. An equal number of motors shall be fired at each temperature: -65°F, +70°F and +165°F. Failure of any rocket motor to meet the requirements of 3.4 shall be cause for rejection of the specific batch of rocket motors.

4.5.5.2 Post static firing disassembly. A post firing disassembly of all contractor tested units shall be conducted by the project engineer. Detailed observations on conditions, including marginal conditions, of individual components shall be noted. When specified in the contract or order (see 6.2), a disassembly findings report shall be submitted to the procuring activity.

4.5.6 Non-destructive tests. Each rocket catapult assembly shall be subjected to the following tests. When specified in the contract or order (see 6.2), the contractor shall furnish test reports detailing the results of all non-destructive tests for each lot of rocket catapults.

4.5.6.1 Radiographic inspection. Rocket catapults shall be radiographically inspected in accordance with MIL-STD-453, radiographic quality level 1. Any deficiency shall be cause for rejection of the unit. Radiographs shall be capable of detecting defects and rocket catapult components 0.03 inch in length or width, whichever is smaller. If all components cannot be shown using standard radiographic techniques, neutron radiography shall be employed to show these components. When specified in the contract (see 6.2), all radiographs taken of the rocket catapult assembly or components thereof shall be forwarded to the activity designated by the procuring activity. Otherwise, all radiographs shall be inspected on-site by a designated Government representative. Acceptance of the loaded rocket catapult lot shall be subject to approval of the radiographs by the designated Government activity.

4.5.6.2 Hydrostatic pressure. Each component listed shall be subjected to the respective internal hydrostatic pressure specified in TABLE II for a minimum of 15 seconds without application of an external load. Any leakage, permanent deformation, or mechanical failure shall result in rejection of the rocket catapult assembly containing that component. Each hydrostatically tested component shall then be subjected to magnetic particle or penetrant inspection as specified, per 4.5.6.3 and 4.5.6.4. Defective components may be replaced by acceptable components and the rocket catapult retested for acceptance.

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4.5.6.3 Magnetic particle inspection. Each motor tube and booster tube shall be 100 percent magnetic particle inspected in accordance with MIL-I-6868. Any defect shall result in rejection of the defective part.

4.5. .4 Penetrant inspection. Each launcher tube and breech assembly shall be 100 percent penetrant inspected in accordance with MIL-I-6866. Any defect shall result in rejection of the defective part.

4.5.6.5 Torque. After ascertaining that each booster tube and breech assembly has been seated with 400 ± 50 , - 0 inch-pounds of Torque, a break-away torque of 200 inch-pounds shall be applied. Any evidence of loosening or deformation of the booster tube and breech assembly shall result in rejection of the part.

4.5.6.6 Residual magnetism. Each rocket catapult assembly shall be passed 6 inches in front of an MS 17983 compass along the entire length of the catapult in accordance with figure 1. If the compass indicator deflects more than 5° in either direction the rocket catapult assembly shall be rejected.

4.5.7 Shear pin test. A load shall be applied at a rate of 0.125 inches per minute to each sample shear pin selected in accordance with 4.5.2.5. If any shear pin fails to shear at 41 ± 5 lbs. the entire lot of shear pins shall be rejected and no pin from that lot shall be used in any catapult assembly.

4.6 Packaging inspection. The packaging, packing and marking shall be inspected to verify conformance with the requirements of section 5.

5. PACKAGING

5.1 Preservation, Packaging and Packing. Unless otherwise specified in the contract or order (see 6.2), preservation, packaging, and packing shall be level A.

5.1.1 Level A. Preservation, packaging and packing shall be in accordance with drawings 11820861 and 11820862 and MIL-P-116. Containers shall conform to Uniform Freight Classification, National Motor Freight Classification, or to rules of other carriers applicable to the mode of transportation.

5.2 Marking. In addition to any special markings required by the contract or order (see 6.2), each container shall be marked in accordance with MIL-STD-129, drawings 11820861 and 11820862, and code of Federal Regulations 49 CFR 171-179 (see 6.8.1).

6. NOTES

6.1 Intended use. The CKU-5/A Aircraft ejection seat catapult assembly is intended to be used to propel an aircraft ejection seat and its occupant safely out and away from a jet aircraft.

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6.2 Ordering data. Procurement documents should specify the following:

6.2.1 Procurement requirements.

- a. Title, number and date of this specification
- b. Quantity required (exclusive of first article and static firing test samples) (see 4.4 and 4.5.2.3)
- c. When a first article sample is not required (see 3.1, 4.4 and 6.5)
- d. Instructions for adaption of first article samples for pressure transducers (see 3.1.1 and 6.6)
- e. Assigned activity for first article inspection and static firing tests (see 4.4, 4.4.2, 4.5.2.3, 4.5.5 and 6.7)
- f. Whether the gunfire vibration test is required (see 4.4.1.2)
- g. Packaging requirements if other than level A (see 5.1)
- h. Any special markings required (see 5.2 and 6.8.1)
- i. Safety precautions (see 6.8)
- j. Disposition of hardware, scrap propellant and metal parts (see 6.9)
- k. That the contractor retain radiographs on file (see 6.10)
- l. Inspection conditions if other than as specified (see 4.3)

6.2.2 Contract data requirements. The items of deliverable data required by this specification are cited in the following paragraphs:

<u>Paragraph</u>	<u>Data Requirement</u>	<u>Applicable DID</u> *
4.5.1	Test Report	-
4.5.6	Non-destructive Test Report	-
4.5.6.1	Radiographs	-

DID's (Data Item Descriptions/DD Forms 1664) for the above data requirement are documented in the applicable ADL (Authorized Data List). Such data will be delivered as identified on completed (numbered) DID's when specified on DD Forms 1423 (Contract Data Requirements Lists) and incorporated into applicable contracts.

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6.3 Description of data. The following paragraphs are a description of data to be included in test reports per 4.5.1 when specified in the contract or order (see 6.2.2).

6.3.1 Propellant description. The following propellant information should be submitted with each production lot. The materials and components of each propellant batch should be listed with the manufacturer, lot number, and date of manufacture. The burning rates at 500, 1000, and 1500 psi performed at -65°, 70° and 165°F for each pressure (three samples at each temperature and pressure per mix) should also be included. In addition, include the results of tensile strength and elongation tests at -65°, 70° and 165°F with a pull rate of 2 inches/minute (three samples at each temperature per mix), heat of explosion (3 samples per mix), differential thermal analysis from -100°F to ignition, and verification that ingredients were properly weighed and added to each mix (mix sheet(s)).

6.3.2 Static firing performance tests. All computations and data required for ballistics evaluation, generated during quality conformance inspection static firings per 4.5.5 (Government) and 4.5.5 (contractor). shall be reported including firing traces. The following information shall also be listed:

- a. Grain designation, manufacture, lot number, and date of propellant manufacture
- b. Type of test equipment
- c. Deviations from standard testing procedures
- d. Additional comments (malfunctions, unusual occurrences)
- e. Disassembly findings report (see 4.5.5.2)

6.3.3 Summary sheet. A summary of the results of the tests for the parameters listed in TABLE I shall be submitted to the designated Government activity for each inspection lot. The summary shall include the sample size, number and nature of defects found, and the disposition (accepted or rejected).

6.3.4 Data cards. Data cards (DD form 1650) shall be completed for each loaded rocket catapult lot. Copies shall be provided in accordance with contract requirements and one copy shall be forwarded to the Commanding Officer, Naval Ordnance Station, Indian Head, MD 20640 (Code 5152).

6.3.5 Propellant/assembly production records. The contractor shall prepare and retain for the service life of the unit propellant production records including batch number, mix designation, rocket motor lot number, rocket motor serial number, cartridge lot number, and cartridge serial number. These shall be cross referenced to the assembled rocket catapult lot number and to specific rocket catapult serial numbers.

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6.4 Definitions.

6.4.1 Rocket motor resultant impulse. The rocket motor resultant impulse is obtained by vectorially adding the longitudinal and normal impulse of the rocket motor taken over the action time.

6.4.2 Rocket motor action time. Action time is determined from the normal thrust time curve, and shall be defined as the time interval from the 10 percent of maximum thrust on the initial rise of curve to the corresponding 10 percent of thrust on the declining portion of the curve.

6.4.3 Rocket motor resultant thrust. The rocket motor resultant thrust is obtained by vectorially adding the two maximum components of rocket thrust that occur at one time.

6.4.4 Rocket motor ignition delay. Rocket motor ignition time is the elapsed time from separation (the point on the catapult thrust trace where the trace begins to drop sharply) to 10 percent of maximum thrust, as measured on the rising portion of the normal component rocket thrust trace.

6.4.5 Catapult ignition delay time. Catapult ignition delay time is the elapsed time from the shearing of the firing pin shear pin to first indication of catapult thrust.

6.4.6 Catapult separation velocity. Catapult separation velocity is defined as the average velocity of the simulated ejected weight propelled horizontally at catapult separation measured over the interval from 6 inches before to 6 inches after separation.

6.4.7 Catapult dynamic response index - (DRI). DRI is representative of the maximum dynamic compression of the vertebral column of the human body, as defined in MIL-S-9479.

6.4.8 Propellant batch. A propellant batch is a mix in which each ingredient is composed entirely of one homogeneous lot.

6.4.9 Rocket motor batch. A rocket motor batch is a group of rocket motors cast from one propellant batch.

6.4.10 Rocket motor lot. A rocket motor lot is a group of rocket motors composed of one or more rocket motor batches all having the same ingredients lots.

6.4.11 Rocket catapult lot. A rocket catapult lot is a group of units composed of one lot of rocket motors, one lot of metal parts and one lot of catapult cartridges.

6.4.12 Primary components. Primary components are all components containing explosive ingredients. This includes the cartridge percussion primers, the cartridge, the rocket motor, and the rocket motor igniter(s).

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6.5 First article sample waiver. First article samples submitted and approved on a recent contract (a contract remaining in production or a contract out of production for less than one year) may be accepted by the procuring activity in lieu of an additional first article inspection. When the first article sample is waived (see 6.2.1(c)), the procurement document should contain a statement specifying that the standards of workmanship exhibited by the previously approved first article sample shall determine the minimum requirements of the current contract or order.

6.6 Pressure transducers. Instructions for adaption of first article catapult assemblies for pressure transducers should be compatible with instrumentation that has a response of not less than 600 Hz and that is capable of detecting ignition peak pressures and unstable burning rates.

6.7 Test facility for preproduction inspection. The Naval Ordnance Station, Indian Head, Maryland is the Design Agent for the product covered by this specification. As such they are equipped to perform the first article inspection and static firing tests specified herein. Except when special conditions warrant otherwise, the Naval Ordnance Station, Indian Head should be designated as the test facility for the first article inspection and the static firing tests (see 6.2.1(e)).

6.8 Safety precautions. The safety precaution requirements of the "Contractors' Safety Manual for Ammunition, Explosives, and Related Dangerous Material" (DOD 4145.26M) are applicable and should be specified in the contract or order as required by the Armed Services Procurement Regulations (ASPR) 1-323.

NOTE: When this specification is used as part of the description of work to be accomplished by a Government activity, the safety precaution requirements of "Ammunition and Explosives Ashore" (OP 5) should be made applicable.

6.8.1 Explosive hazard classification. The explosive hazard classification for this rocket catapult has been designated as:

Explosive Hazard Classification - Class 2

Storage Compatibility Group - Group J

Department of Transportation (DOT) Hazard Class - Cl B

DOT Marking - Propellant Explosive

6.8.2 Hazard notice. The rocket catapult described herein is flammable and/or explosive and consequently presents a hazard in manufacture, handling, storage and shipment. The contract or should recognize this hazard and take appropriate measures to guard and protect against fire, explosion, adverse environment, corrosive atmosphere, rough handling and electrically induced incidence.

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6.9 Disposition of hardware, scrap propellant, and metal parts.

The contract should specify that all items purchased become the property of the U.S. Government; no hardware, propellant, or metal parts acceptable, scrapped, or tested be disposed of without authorization of the procuring activity; all items be made available to the procuring activity upon request; and that the disposal of any tested hardware, propellant, or metal parts without authorization by the procuring activity will result in the test being declared invalid, and a retest will be required.

6.10 Retention of radiographs. The contract should specify that all radiographs of accepted lots of rocket catapults be retained on file by the contractor for 7 years or 1 year past the service life of the unit, whichever is longer.

6.11 Life. The rocket catapult has a design life of 7 years with an installed service life of 5 years from the date of propellant manufacture.

Custodian
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Preparing Activity
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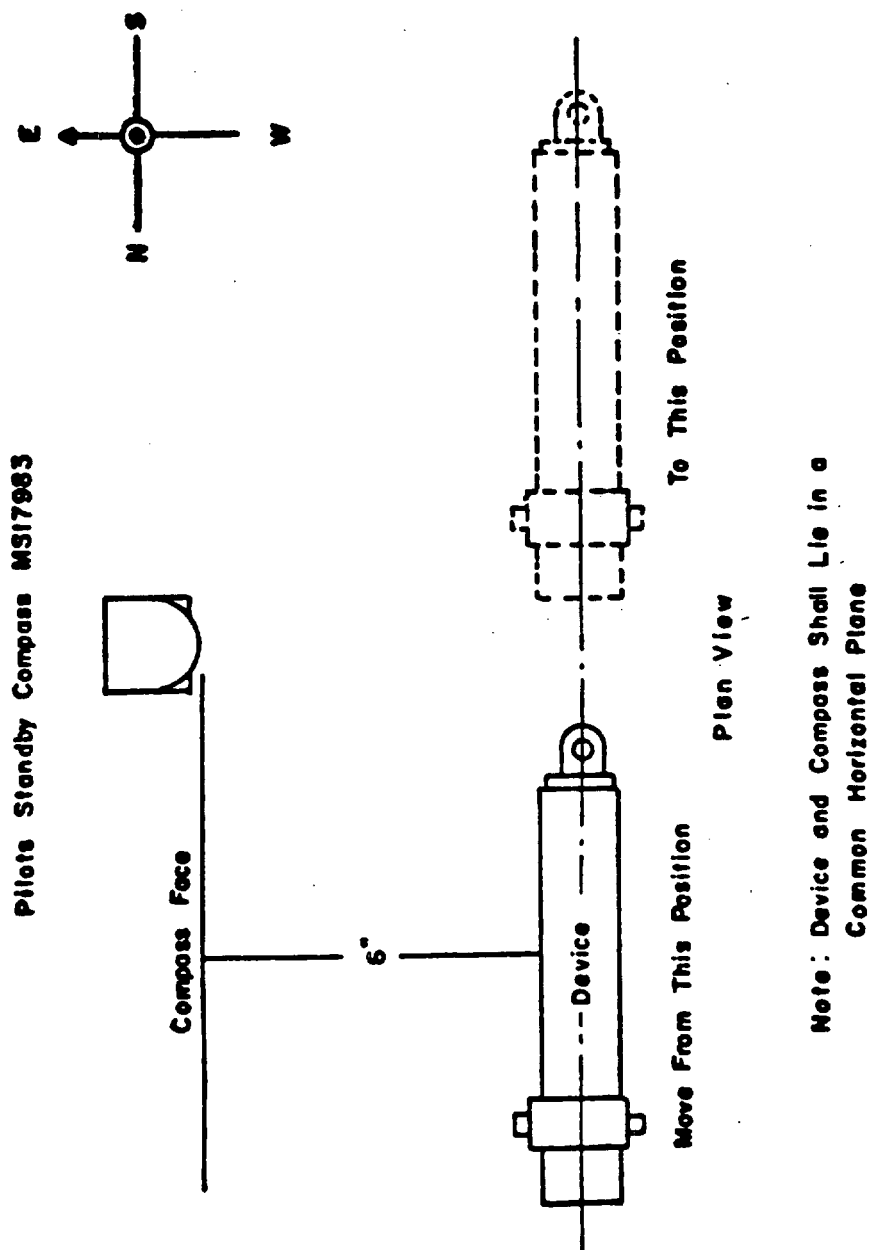


FIGURE 1. Layout for Determination of Residual Magnetism in Device.