MILITARY SPECIFICATION

MOUNT, TELESCOPE: M95

1. SCOPE

1.1 This specification covers one type of mount known as Telescope Mount: M95 for use with Panoramic Telescope :M12 Series.

2. APPLICABLE DOCUMENTS

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

SPECIFICATIONS

Military

MIL-F-13926	Fire Control Materiel: General Specification Governing the Manufacture and Inspection of
MIL-F-14619	Fire Control Parts, Equipment and Tools; Packaging of

STANDARDS

Military

MIL-STD-105	Sampling Procedures and Tables for Inspection by Attributes
MIL-STD-130	Identification Marking of U.S. Military Property

DRAWINGS

Ordnance Corps

F8261575	Mount, Telescope: M95
IEL-8261575	Index of Inspection Equipment List.
LSQAP-8261575	Supplementary Quality Assurance List Index

FSC 1240

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

3. REQUIREMENTS

3.1 Production model.- At the beginning of production, one mount representative of production, shall be made available to the Government to determine if the mount meets all the requirements of this specification.

3.2 Materials.- Material shall be in accordance with applicable drawings and specifications forming a part of this specification.

3.3 Construction.- The mount shall be manufactured in accordance with Drawing F8261575, "Mount, Telescope: M95", and drawings pertaining thereto. The requirements of this specification are detailed only to the extent considered necessary to insure the inherent quality and the performance capabilities of the product prior to final acceptance by the Government.

3.4 General specification.- The contractor shall be responsible for adherence to, and compliance with, the following requirements of Specification MIL-F-13926:

(a) Order of precedence
(b) Protective finished surfaces
(c) Special accuracy
(d) Finish, painting and protective
(e) Workmanship

3.5 Environmental

3.5.1 Operating temperatures.- The mount shall meet the performance requirements specified in 3.7.4 while exposed to, and thermally stabilized at ambient temperatures of plus 150 degrees Fahrenheit and minus 40 degrees Fahrenheit.

3.5.2 Vibration.- With the mount set up in its normal operating position, it shall be vibrated in a vertical plane at a constant frequency of 30 cycles per second with an amplitude of 1/16 inch (1/8 inch maximum excursion) for a period of 5 minutes plus or minus 15 seconds. Subsequent to vibration there shall be no evidence of loose parts or damage and the mount shall meet all the following requirements of this specification.

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3.6 Adjustment.- The mount shall be positioned as shown on Drawing F8261575 with the center line of the mounting bore horizontal and the bracket for the gunner's quadrant horizontal. The mount shall be further adjusted as follows:

3.6.1 Axis of telescope socket vertical and top surface horizontal within one minute of arc.

3.6.2 The elevation level vial bubble centered.

3.6.3 Adjusting screws in telescope socket set to bring line of sight of a Panoramic Telescope: M2 Series or equivalent perpendicular to center line of the mounting bore within plus or minus 0.1 mil.

3.6.4 Elevation scale and micrometer adjusted so that zero graduations coincide with their respective indexes.

3.6.5 The mount cross leveled to the position where the deviation of line of sight from a plumb line is within plus or minus 0.2 mil when the holding device is rotated from zero to 1100 mils elevation with the cross level bubble centered.

3.7 Performance.- With the mount adjusted as specified in 3.6 the following requirements shall be met.

3.7.1 Plumb travel.- With the line of sight in coincidence with a plumb line, the line of sight shall not deviate from the plumb line by more than 0.75 mil when the mount is rotated from zero to 1100 mils by means of the elevating worm.

3.7.2 Elevation error.- The error in any elevation reading shall not exceed 1.0 mil, excluding backlash.

3.7.3 Backlash.- Backlash in the elevation mechanism shall not exceed 0.5 mil.

3.7.4 Torque.- The torque required to operate the knobs at standard ambient temperature (60 to 90 degrees Fahrenheit) shall be within the tolerance specified in Table I below. When measured at the extreme operating temperatures specified in 3.5.1, the torque values shall not have changed from the respective values obtainedat standard ambient temperature by more than 3 pound inches.

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TABLE I - TORQUE (pound-inches)

	Minimum	Maximum
Elevation mechanism	4	11
Cross leveling knob	4	9

3.7.5 Azimuth correction.- The mount shall be capable of giving azimuth correction readings in accordance with Table II.

TABLE II - AZIMUTH CORRECTIONS

Angle of Cant (Cross Level)	Elevation Angle Measured on Mount, Elev. Scale	Azimuth Correction Reading	Tolerance Plus or Minus
Degrees	Mils	Mils	Mils
7	500	66.9	1.0
7	800	125.4	1.5
7	1100	236.1	2.0

3.8 Identification marking.- Unless otherwise specified, identification marking shall be in accordance with Standard MIL-STD-130.

4. QUALITY ASSURANCE PROVISIONS

4.1 Contractor inspection.- 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 Contractor's quality assurance system.- The contractor shall provide and maintain an adequate quality assurance system acceptable to the Government covering the supplies under the contract. A current written description of the system shall be submitted to the contracting officer prior to initiation of production. The written description will be considered acceptable when it provides:

(a) The quality assurance required by the applicable drawings and specifications listed in the contract or order.
(b) Contractor's quality standards of acceptability.
(c) Procedure for continually evaluating product quality.
(d) Procedure for continually reporting evidence of actual product quality.
(e) Measures for preventing any significant departure of product quality from standards.

4.2.1 The contractor will not be restricted to the inspection station or to the method of inspection listed provided that an equivalent control is included in the approved quality assurance procedure. In cases of dispute as to whether or not certain procedures of the system provide equal assurance, the comparable procedure required by this specification shall be used. The contractor shall notify the Government of and obtain approval for any change to the written procedure that migth affect the degree of assurance required by this specification and other applicable documents referenced herein.

4.3 Government verification.- All quality assurance operations performed by the contractor will be subject to Government verification at unscheduled intervals. Verification will consist of (a) surveillance of the operations to determine that the practices, methods, and procedures of the written inspection plan are being properly applied, and (b) Government product inspection to measure quality of product offered for acceptance. Deviation from the prescribed or agreed-upon procedures, or instances of poor practices which might have a detrimental affect upon the quality of the product, will be immediately called to the attention of the contractor. Failure of the contractor to promptly correct deficiencies discovered will be cause for suspension of acceptance until correction has been made or until conformance of product to prescribed criteria has been demonstrated. To avoid interference with operations, the contractor will designate a responsible official or officials to whom the Government inspector will report such instances.

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4.4 Production model.- Unless otherwise specified in the contract, one mount shall be selected by the Government inspector as soon as practicable after the start of production, and be inspected by the contractor under the surveillance of the Government. This inspection shall be conducted at the contractor's facility, or Government approved laboratory using test equipment authorized for use on the contract. The model shall be inspected for all requirements of this specification by utilizing examination and testing methods prescribed herein.

4.4.1 Production model failure.- Should the production model fail to pass the prescribed examinations and tests, the contractor shall cease those operations which are causing the rejection and shall make the necessary corrections. When corrections in the process have been made, a new production model shall be examined and tested by the contractor under the surveillance of the Government. Acceptance of production lots will not commence until an acceptable production model is submitted and corrective actions have been taken to eliminate deficiencies.

4.5 Inspection provisions.

4.5.1 Lot formation.- Unless otherwise specified by the contracting officer, or his representative, inspection lot sizes and lot formation shall be in accordance with Standard MIL-STD-105.

4.5.2 Inspection of components. Inspection requirements for component parts and subassemblies are contained herein and on Supplementary Quality Assurance Provisions (SQAP) listed in Supplementary Quality Assurance Provisions List (LSQAP)-8261575.

4.5.2.1 Contents of SQAP.- The contents of SQAP shall represent the minimum inspection requirements and shall be the basis for acceptance or rejection by lot of those components covered by a SQAP. The Government reserves the right, however, to inspect for the requirements of all drawings and specifications, and to reject individual non-conforming items.

4.5.2.2 Contractor's inspection for all components not covered by SQAP.- Inspection for these components shall be in accordance with the inspection procedures of the written inspection plan required by 4.2 and 4.2.1. The plan shall include procedures for checking all positional and functional characteristics shown on the drawings which indicate precision requirements and have a bearing on the functional accuracy and performance of the mount.

4.5.2.3 Disposition of non-conforming product.- Disposition of non-conforming components shall be in accordance with Standard MIL-STD-105.

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4.6 Control of materials.- Materials shall be tested to determine conformance to contractually applicable specifications. Such tests may be conducted in the prime contractor's or subcontractor's facilities, or in other suitably equipped laboratories. The test results shall be available to the Government inspector for review. Certified test reports, identifiable with the material, may be accepted in lieu of repeated tests. The Government reserves the right, in any case, to require retests to assure that the materials are acceptable.

4.7 Acceptance tests.

4.7.1 Classification of defects.- The classification of defects in Tables III and IV shall constitute the minimum inspection requirements to be performed by the contractor prior to acceptance or rejection by lot. The Government reserves the right to inspect for any applicable requirement, and to reject individual non-conforming items.

4.7.2 Disposition of rejected lots.- Rejected lots shall be screened for all defective characteristics. After corrections have been made and the Government inspector informed of the corrective action taken, the lot shall be resubmitted for acceptance as outlined in Standard MIL-STD-105.

TABLE III - CLASSIFICATION OF DEFECTS

Use Inspection Level II, and Sampling Plan Table IV-A of Standard MIL-STD-105

CRITICAL: NONE DEFINED

MAJOR: AQL 1.5%		Req't Par.	QA. Par.	Test Method
101.	Completeness of assy	As per dwg	------	Visual
102.	Plumb travel	3.7.1	4.9.3	Device, Special Testing (DST)
103.	Elevation error	3.7.2	4.9.4	DST
104.	Backlash	3.7.3	4.9.5	DST
105.	Torque	3.7.4	4.9.6	DST
106.	Azimuth correction	3.7.5	4.9.7	DST
107.	Identification marking	3.8	4.9.8	Visual

MINOR: NONE DEFINED

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TABLE IV - CLASSIFICATION OF DEFECTS

Use Inspection Level L7, and Sampling Plan Table IV-A of Standard MIL-STD-105

CRITICAL: NONE DEFINED			
MAJOR: AQL 6.5%	Req't Par.	QA. Par.	Test Method
101. Operating temperatures	3.5.1	4.9.1.1	DST
102. Vibration	3.5.2	4.9.1.2	DST

4.8 Inspection equipment.

4.8.1 Contractor provisions.- Unless otherwise specified in the contract, the contractor shall provide and properly utilize all gaging, measuring, and testing equipment of the required accuracy for the performance of all inspection examinations and tests required to be performed by the contractor under this contract. The contractor shall be responsible for the maintenance of the equipment including surveillance, calibration, and rehabilitation, on a regularly scheduled basis, and shall have available, all calibration equipment and other instrumentation essential for calibration and certification of the inspection equipment. The contractor also shall maintain records of inspection equipment surveillance and calibration, and shall make these records available for review by the Government. The Government reserves the right to certify inspection equipment, and to use it for Government verification inspection or acceptance inspection.

4.8.1.1 Accuracy requirements.- Inspection equipment which incorporates features for measuring values or sizes, established by product requirements, shall be capable of measuring these values within an accuracy of ten percent of the specified tolerance unless otherwise specified. In cases where the ten percent accuracy imposes impractical or very difficult design and fabrication problems, or results in a test equipment cost factor which is exorbitant in relation to the cost and application of the product to be inspected, the Government shall be expeditiously advised in order that necessary appropriate action can be taken.

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4.8.1.2 Device to test plumb travel, elevation error, backlash, and azimuth correction.- The device shall be so constructed as to hold the mount in a position as shown on the Drawing F8261575 with the center line of the mounting bore and the bracket for the gunner's quadrant horizontal. The device shall also be capable of adjusting the mount in accordance with the requirements specified in 3.6. Means shall be provided to raise and depress the device an amount equal to the entire elevation movement of the mount. The device shall also be capable of adjusting the mount for cant corrections of at least seven degrees. The dimensions used to establish the required position of the mount shall be within a tolerance of plus or minus 0.0005 inch. The medium use to test movement and backlash shall be free from all shake, shift, or other movement which might contribute to an unrealistic test.

4.8.1.3 Accessory device to determine plumb travel.- The accessory device shall be capable of establishing a line of sight in accordance with the requirements specified in 3.7.1.

4.8.1.4 Device to test vibration requirements.- The device shall be a type capable of producing vertical motion, at an amplitude of not less than 1/16 inch (1/8 inch total movement) and at a frequency of 30 cycles per second. The device will have an adapter to which the mount will be set up in its normal operating position.

4.8.1.5 Device to test torque requirements.- A torque wrench type tester with a minimum range of zero to 15 pound-inches shall be used to test for the torque requirements. The accuracy shall be plus or minus 1/4 pound-inch throughout the entire zone of excursion. This device shall be equipped with suitable adapters to accommodate testing of the various knobs.

4.8.1.6 All special set-up and calibration equipment necessary for certification of device accuracy shall be furnished and will become a part of the device.

4.8.2 Government provisions.- Test equipment listed in IEL-8261575, when available, will be used for Government product inspection (reference 4.3(b)), and to settle disputes (reference 4.2). Drawings of this equipment will be furnished the contractor for informational purposes.

4.9 Test methods and procedures.

4.9.1 Environmental.

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4.9.1.1 Operating temperatures.- The test equipment to be used when performing the temperature tests shall be such that the equipment under test shall not exceed fifty percent of the internal volume of the test chamber, and no portion shall be closer than six inches from any surface of the chamber.

4.9.1.1.1 The mount to be tested shall be placed in the test chamber in its normal operating position. The test shall be conducted in accordance with Procedure I of Specification MIL-F-13926 to the conditions specified in 3.5.1.

4.9.1.2 Vibration.- The mount shall be set up, in its normal operating position, on a suitable special testing device and vibrated in accordance with the requirements of 3.5.2.

4.9.2 Adjustment.- The telescope mount shall be set up on a suitable special testing device in a position as shown on the Drawing F8261575. The mount shall be adjusted and positioned in accordance with the requirements specified in 3.6 and inspected in accordance with the following methods and procedures to determine conformance to the requirements specified in 3.7.

4.9.3 Plumb travel.- The elevation knob of the mount shall be rotated from zero to 1100 mils. The deviation of the line of sight, established by the accessory device, shall be visually checked for conformance to the requirements specified in 3.7.1. The deviation shall not exceed the allowable tolerance.

4.9.4 Elevation error.- The special testing device shall be rotated to a particular elevation reading. The elevation knob of the mount shall be rotated in the opposite direction until the mount has traveled an equal distance as indicated by the elevation scale and micrometer. The line of sight, as established by the accessory device, shall not deviate more than the allowable tolerance specified in 3.7.2. The procedure shall be repeated, and elevation readings shall be taken at a minimum of five positions equally spaced throughout the entire elevation movement.

4.9.5 Backlash.- A special testing device shall be used to determine any backlash. The amount of backlash shall be measured by taking at least three readings in alternate directions, equally distributed throughout the entire elevation movement. Each reading shall not exceed the allowable tolerance specified in 3.7.3.

4.9.6 Torque.- A special testing device shall be used to determine the amount of running torque required to rotate the elevation mechanism knob and the cross leveling knob. The maximum amount of running torque shall not exceed the requirements specified in 3.7.4.

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4.9.7 Azimuth correction.- The cross leveling knob of the mount shall be adjusted for a cant angle of seven degrees. The elevation mechanism knob shall be adjusted for an elevation angle of 500 mils as indicated by the elevation scale and micrometer of the mount. The cross level and horizontal level bubbles of the mount shall be centered by adjusting the cross level and elevation knobs of the special testing device. The azimuth correction reading determined by the special testing device shall be visually checked for conformance to the requirements specified in Table II. The indication shall not exceed the allowable tolerance. The procedure shall be repeated for the remaining elevation angles indicated in Table II.

4.9.8 Identification marking.- Identification marking test is visual and made in accordance with Standard MIL-STD-130.

5. PREPARATION FOR DELIVERY

5.1 Packaging, packing, and marking.- The mount shall be packaged, packed, and marked in accordance with Specification MIL-F-14619/P12891. The level of protection shall be as specified in the procurement document.

6. NOTES

6.1 Intended use.- The telescope mount is intended to maintain the line of sight of the Panoramic Telescope M2 Series in a fixed relationship to the bore axis of various artillery weapons.

6.2 Ordering data.- Procurement documents should specify the following:

(a) Title, number, and date of this specification.
(b) Selection of applicable levels of preservation, packaging, and packing.
(c) Applicable stock number.

6.3 Design information.- Design information regarding specific equipment not covered or referenced by this specification may be obtained from the procuring activity upon the specific request of the contractor.

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6.4 Definitions.

6.4.1 Special testing device (DST).- Special testing devices are designed to check the function of an assembled unit.

6.4.2 SQAP (Supplementary Quality Assurance Provisions).-LSQAP (List of SQAP's), and IEL (Inspection Equipment List) pertinent to each component and subassembly are identified by the Ordnance drawing number of the item prefixed by the above appropriate letter designation.

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