

MIL-C-48550(AR)
15 August 1978

MILITARY SPECIFICATION

COLLIMATOR, INFINITY AIMING REFERENCE: M1E1

This specification is approved for use by the U.S. Army Armament Research and Development Command, and is available for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 This specification covers the Infinity Aiming Reference Collimator, M1E1 which consists of a collimator with integral tripod and cover. This equipment is referenced throughout this specification as "Collimator". The reticle in this collimator is radioactively illuminated.

2. APPLICABLE DOCUMENTS

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

SPECIFICATIONS

Military

| | |
|-------------|---|
| MIL-F-13926 | Fire Control Material, General specification the Manufacture and Inspection of |
| MIL-I-45607 | inspection Equipment; Acquisition Maintenance, and Disposition Of |
| MIL-O-13830 | Optical Components For Fire Control instruments, General Specification Governing the Manufacture, Assembly, and Inspection Of |
| MIL-P-14232 | Parts, Equipment and Tools For Army Material, Packaging and Packing Of |

STANDARDS

Military

| | |
|-------------|---|
| MIL-STD-105 | Sampling Procedures And Tables For Inspection By Attributes |
| MIL-STD-109 | Quality Assurance Terms and Definitions |

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commander, US Army Armament Research and Development Command, Attn. DRDAR-QA, Dover, New Jersey 07801 by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

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DRAWINGS

U.S. Army, Frankford Arsenal

F10556235

Collimator,Infinity Aiming
Reference: M1E1.

PACKAGING DATA SHEET

MIL-P-14232/P10556235

Packaging of Collimator infinity
Aiming Reference: M1E1.

(Copies of specifications, standards, drawings, and packaging data sheets 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 document forms a part of this specification to the extent specified herein. Unless otherwise indicated, the issue in effect on data of invitation for bids or request for proposal shall apply.

CODE OF FEDERAL REGULATIONS - TITLE 10

(Application for copies should be addressed to Superintendent of Documents. US Government Printing Office, Washington, D.C. 02402).

3. REQUIREMENTS

3.1 "Regulations. - A specific license shall be required pursuant to the "Code of Federal Regulations - Title 10", to manufacture, produce, transfer, receive, acquire, own,possess, use, import or export Tritium activated luminous sources as prescribed on the drawings for the collimator.

3.2 Fabrication. - The collimator shall be manufactured in accordance with Drawing F10556235 "Collimator, Infinity Aiming, Reference: M1A1 and all drawings pertaining thereto.

3.3 General specifications. - The contractor shall be responsible for adherence to & compliance with, the following requirements of Specifications MIL-O-13830 and MIL-F-13926.

3.3.1 MIL-O-13830

a. Cleanliness

3.3.2 MIL-F-13926

Order of precedence

- a. Dimensions and tolerances
- c. Inorganic protective surface finishes
- d. Part identification and marking
- e. Workmanship
- f. Source control drawings.
- g. Applicable Quality Assurance Provisions

Performance.

3.4.1 Environmental.

3.4.1.1 Storage temperatures. - The collimator shall show no evidence of physical failure and shall meet all requirements of this specification at standard ambient temperatures of -80° F and +160°F.

3.4.1.2 Operating temperatures. - The collimator shall meet the applicable requirements of 3.4.4.4 to 3.4.4.8, inclusive while exposed to and thermally stabilized at ambient temperatures of +150°F and -40°F. Upon return to standard ambient temperature the collimator shall be subjected to the requirements of 3.4.1.3.

3.4.1.3 Vibration. - The collimator unit enclosed in its cover with the tripod legs secured in place, shall be vibrated while in a horizontal position 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 the collimator shall meet the requirements of 3.4.1.4 to 3.4.4.12 inclusive.

3.4.1.4 Rain. - The collimator unit with the cover secured in place and the legs folded to the carrying position shall be exposed to the requirements of Procedure I of the rain test Specified in Specification MIL-F-13926. Immediately following the rain test neither the interior of the cover nor the Collimator shall show evidence of water penetration.

3.4.2 Sealing. - The collimator unit (telescope) shall be capable of holding an internal pressure of dry nitrogen of 5 psi for a period of 2 hours \pm 5 minutes without loss of pressure in excess of 0.2 psi for a 2 hour period. The internal pressure of the telescope shall then be reduced to zero psig. The telescope shall then be flushed with dry nitrogen until the interior atmosphere has a dew point at least as low as minus 25°F. The telescope shall then be sealed with an internal pressure of between 0.25 and 0.50 psig of dry nitrogen.

Optical.

3.4.3.1 Reticle lean. - With the vertical reticle line parallel to the image of a plumb line, the bubble of the level vial shall be within the central graduation marks on the vial.

3.4.3.2 Reticle Accuracy. - The angle subtended by the two 50 mil graduation lines on the horizontal axis of the reticle pattern shall be 100 mils plus or minus 0.25 mil

3.4.3.3 Parallax. - The parallax between the center cross of the reticle pattern and the image of an infinity target shall not exceed 0.1 mil

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3.4.3.4 Cleanliness. - The optical system shall meet the cleanliness requirements of Specification MIL-O-13830 and there shall be no more than 3 particles of dirt visible on the reticle and the area of such particle shall not be in excess of the. area equivalent to a size 10 dig. There shall be no dirt within the optical system which interferes with observation or adversely affects image quality.

3.4.3.5 Reticle illumination. - All reticle graduations and numbers shall be clearly defined when observed through a four power telescope in ambient darkness at distances from 15 to 48 feet inclusive.

3.4.3.5 Reticle illumination. - Brightness of the collimated light output measured in complete darkness at approximately one quarter inch from end of collimator shall be a minimum of 275 microlamberts.

NOTE: This requirement allows for transmission losses in the fully assembled collimator and for degradation related to the combined effects of workmanship and aging due to the elapsed time associated with the collimator assembly process. It provides approximately 9 months from the time of a fully assembled and tested unit.

3.4.4 Mechanical.

3.4.4.1 Elevation travel. - The elevation travel of the line of sight shall cover the minimum excursion from minus 800 mils when the tripod legs are fully extended.

3.4.4.2 Azimuth travel. - The instrument shall provide a full and unrestricted 6400 rolls azimuth rotation.

3.4.4.3 Open sight. - The line of sight of the open sight shall be parallel to the optical axis within one degree.

3.4.4.4 Operability. - There shall be no looseness as assembly, shake. restriction or binding of any part of the equipment when the collimator is placed from the carrying position to operational position. The hinge of the tripod legs shall have sufficient torque to support the fully extended legs in a horizontal position.

3.4.4.5 Knob travel. - Each knob shall provide full locking to free movement of the instrument component.

3.4.4.6 Knob locks. - The locks shall be operable when exposed to the requirements of 3.4.1.2 and shall meet the requirements of Table 1 when exposed to temperatures of +60°F to 90°F. The part shall not move when the test value is applied.

"TABLE I. - KNOB LOCKS

| <u>LOCK CONTROL</u> | <u>TORQUE TO SECURE</u> <u>(INCH POUNDS)</u> | <u>TEST VALUE</u> |
|-----------------------------|---|--------------------------|
| Rotate collimator on tripod | 25 | 50 inch pounds of torque |
| Cross level the collimator | 25 | 50 inch pounds of torque |
| Elevate the collimator | 25 | 10 foot pounds of torque |
| Telescope of tripod legs | 25 | 40 pounds of force |

3.4.4.7 Telescope alignment. -With the lock released the minimum torque required to rotate the scope to center the level vial shall not be less than eight inch pounds and the maximum torque required shall not exceed 22 inch pounds when checked at standard ambient " temperature. The maximum torque shall not exceed 35 inch pounds when checked at extreme temperature of 3.4.1.2.

3.4.4.8 Azimuth fine adjustment. - The torque required to operate the azimuth fine adjustment knob shall not exceed five inch pounds when checked at standard ambient temperatures and shall not exceed 10 inch pounds when exposed to and checked at extreme temperatures of 3.4.1.2.

With the azimuth fine adjustment knob at its extreme travel position (both in and out), the adjustment assembly shall withstand a torque load of 25 to 30 inch pounds, without stripping the threads within the adjustment assembly when checked at standard ambient temperature of 3.4.1.2.

3.4.4.9 Fastening devices. - Catches and similar fastening devices used to secure the cover shall function without interference; and, when secured, shall securely fasten the cover to the base.

3.4.4.10 Carrying handle. - The carrying handle shall be securely attached, and show no evidence of looseness of assembly.

3.4.4.11 Strap security. - The strap shall be subjected to a direct pull of 25 pounds at 90 degrees to the securing surface, the strap shall remain secure, the rivets firm, and the-cover shall subsequently meet the requirements of 3.4.1.4.

3.4.4.1.2 Gasket. - The rubber gasket at the base of the cover assembly shall be securely attached and show no gap where ends meet.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. - Unless otherwise specified in the cotract or purchase order, the supplier is responsible for the performance of all inspection requirements as-specified herein. Except as otherwise specified, the supplier may utilize his own facilities 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.

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4.1.1 General provisions. - The component and subassembly inspection requirements of MIL-F-13926 form a part of the Quality Assurance Provisions of this specification. Definitions of inspection term shall be as listed in MIL-STD-109.

4.2 First article (initial production)The approval. - The requirement for first article approval and the responsibility (Government or contractor) for first article testing shall be as specified in the contract. The sample for first article approval tests shall consist of three collimators plus three each of all items covered by SQAP. The sample shall be manufactured In the same manner, using the same materials, equipment, processes, and procedures that will be used during production. All parts and materials, including packaging shall be obtained from the same source of supply that will be used during production.

4.2.1 Government testing. - When the Government is responsible for conducting first article approval tests, the contractor, prior to submitting the sample to the Government, shall inspect the sample to insure that it conforms to all the requirements of the contract and submit a record of this inspection with the sample, including certificates of conformance for materials.

4.2.2 Contractor testing. - When the contractor is responsible for conducting first article approval tests, the sample shall be inspected by the contractor for all the requirements of the contractor. The sample and a record of this inspection, including certificates of conformance for materials, shall be submitted to the Government for approval. The Government reserves the right to witness the contractor's inspection.

4.3 Inspection provisions.

4.3.1 Submission of product. - Unless otherwise specified by the contracting officer, inspection lot size, lot formation and presentation of lots shall be in accordance with "Submission of Product" provisions of MIL-STD-105.

4.3.2 Examination of tests.

4.3.2.1 Components and subassemblies. -All components and subassemblies shall be inspected in accordance with the inspection provisions contained in Supplementary Quality Assurance provisions (SQAP) listed in the technical data package (TDP). In the absence of SQAP'S the applicable Quality Assurance Provisions of MIL-F-13926 shall apply.

4.3.2.2 Final acceptance inspection. - The characteristics shown in Tables II, III, IV, and the packaging and marking requirements of 4.3.2.2.2 shall constitute the minimum inspection to be performed by supplier after first article approval and prior to Government acceptance or rejection by item or lots

4.3.2.2.1 Sampling inspection. - Examinations and tests shall be performed on an individual characteristic basis in accordance with MIL-STD-105, inspection level II of Table I, Sampling Plan Table II-A, unless otherwise specified under the following tables:

TABLE II. - CLASSIFICATION OF DEFECTS

Vibration and sealing tests shall be performed in that order prior to the conduct of the other tests in this table.

| <u>CHARACTERISTIC</u> | | |
|-----------------------------------|--------------------|-----------------------|
| <u>MAJOR: AQL 0.65% DEFECTIVE</u> | <u>REQUIREMENT</u> | <u>TEST PROCEDURE</u> |
| 101. Vibration | 304.1.3 | 4.5.1.3 |
| 102. Sealing - | 3.4.2 | 4.5.2 |
| 103. Reticle lean | 3.4.3.1 | 4.5.3.1 |
| 104. Reticle accuracy | 3.4.3.2 | 4.5.3.2 |
| 105. Parallax | 3.4.3.3 | 4.5.3.3 |
| 106. Cleanliness | 3.4.3.4 | 4.5.3.4 |
| 107. Reticle illumination | 3.4.3.5 | 4.5.3.5 |
| 108. Elevation travel | 3.4.4.1 | 4.5.4.1 |
| 109. Azimuth travel | 3.4.4.2 | 4.5.4.2 |
| 110. Open sight | 3.4.4.3 | 4.5.4.3 |
| 111. Operability | 3.4.4.4 | 4.5.4.4 |
| 112. Knob travel | 3.4.4.5 | 4.5.4.5 |
| 113. Knob locks | 3.4.4.6 | 4.5.4.6 |
| 114. Telescope alinement | 3.4.4.7 | 4.5.4.7 |
| 115. Azimuth fine adjustment | 3.4.4.8 | 4.5.4.8 |
| 116. Fastening Devices | 3.4.4.9 | 4.5.4.9 |
| 117. Carrying handle | 3.4.4.10 | 4.5.4.10 |
| 118. Strap security | 3.4.4.11 | 4.5.4.11 |
| 119. Gasket | 3.4.4.12 | 4.5.4.12 |
| <u>MINOR: AQL 4.0% DEFECTIVE</u> | | |
| 201. Locking compound screw heads | 3.3.2(e) | Visual |
| 202. Paint finishes | 3.3.2(c) | Visual |

TABLE III. - SPECIAL SAMPLING

One collimator shall be selected at random from each 50 produced. Samples shall meet all the requirements of Tables II subsequent to the conduct of the following examinations and tests, except Characteristics 101 (Vibration), 117 (Carrying handle), 118 (Strap security) shall be performed prior to 403 (Rain).

| <u>CHARACTERISTIC</u> | <u>REQUIREMENT</u> | <u>TEST PROCEDURE</u> |
|----------------------------|--------------------|-----------------------|
| 401. Storage temperature | 3.4.1.1 | 4.5.1.1 |
| 402. Operating temperature | 3.4.1.2 | 4.5.1.2 |
| 403. Rain | 3.4.1.4 | 4.5.1.4 |

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4.3.2.2.1.1 Failure of sample. - Should any one item of sampling under Tables III or IV fail to meet the specified test requirements, acceptance of product shall be suspended by the Government until necessary corrections (see 4.3.2.2.3) have been made by contractor and resubmitted item been approved.

4.3.2.2.2 Inspection of packaging and marking.- Examination and tests for packaging shall be in accordance with MIL-P-14232 and Section 5 herein.

4.3.2.2.3 Acceptance and rejection. - Rejected lots shall be screened for all defection characteristics. Removal or correction of defective units and resubmittance of rejected lots shall be in accordance with "Acceptance and Rejection" as specified in MIL-STD-105.

4.4 Inspection equipment. - Except as otherwise provided for by the contract, the contract shall supply and maintain inspection equipment in accordance with the applicable requirements of MIL-I-45607.

4.4.1 Government furnished inspection equipment. - Where the contract provides for Government furnished test equipment, supply and maintenance of test equipment shall be in accordance with the applicable requirements specified in MIL-I-45607.

4.4.2 Contractor furnished inspection equipment.

4.4.2.1 Government design. - Unless otherwise specified in the contract, all inspection equipment specified by drawing number in specifications or SQAP forming a part of the contract shall be supplied by the contractor in accordance With technical data listed in the technical data package (TDP).

4.4.2.2 Contractor design. - The contractor shall design and supply inspection equipment compatible with the "Test Methods and Procedures" specified in 4.6 of this specification and with the component inspection procedures specified in "Examination" and "Test Facilities" requirements of MIL-F-13926. Since tolerance and test equipment is normally considered to be within 10% of the product tolerance for which it is intended, this inherent error in the test equipment design must be considered as part of the prescribed product tolerance limits, Thus, concept, construction, materials, dimensions and tolerances used in the design of test equipment shall be so selected and controlled as to insure that the test equipment will reliably indicate acceptability of a product which does not exceed 90% of the prescribed tolerance limit, and permit positive rejection when non-conforming. Construction shall be such as to facilitate routine calibration of test equipment.

4.5 Test methods and Procedures.

4.5.1 Environmental.

4.5.1.1 Storage temperature. - The test equipment utilized in this test shall be in accordance with the "Test Facilities" requirements of MIL-F-13926 and the conditions in 3.4.1.1. The collimator shall be placed in the test chamber and the temperature of the chamber reduced gradually (see "NOTE" Below) to -80°F. The collimator shall remain at this temperature for a minimum of five hours. At the completion of this five hour period, the temperature of the test chamber shall be gradually raised (see NOTE below) at +160°F. The collimator shall remain at this temperature for a minimum of five hours. At the completion of this five hour period, the temperature of the test chamber shall be gradually reduced to room ambient temperature (+60 to +90 F). and the collimator removed from the test chamber. The collimator shall then be subjected to a visual, tactile, and audible examination. The collimator shall conform to the requirements of 3.4.1.1.

NOTE: The rate of temperature change in the test chamber shall not exceed 20 degrees per hour throughout the temperature cycling tests of 4.5.1.1 and 4.5.1.2.

4.5.1.2 Operating temperature. - This test shall be performed in the same manner as the test of 4.5.1.1, except that the chamber shall be held at the temperatures specified in 3.4.1.2. While at these temperature extras the collimator shall be subjected to the tests of 4.5.4.4 to 4.5.4.8 inclusive to determine compliance with 3.4.1.2.

4.5.1.3 Vibration. - This test shall be conducted in accordance with 3.4.1.3 subsequent to vibration the collimator assembly shall be subjected to a visual and tactile examination and shall show no evidence of damage. The collimator assembly shall then be subjected to the remaining tests In this specification and shall meet the specified requirements.

4.5.1.4 Rain. - This test shall be conducted in accordance with Procedure I of the rain test in Specification MIL-F-13926. Upon completion of this test, the cover shall be removed and the collimator and equipment shall be examined for evidence of water penetration or damage in accordance with requirements of 3.4.1.4.

4.5.2 Sealing. - Internal pressurizing of the collimator to test for sealing shall be performed using nitrogen gas having a dew point at least as low as -25 F, and commercial type pressure testing equipment capable of pressurizing the collimator to the pressure specified in 3.4.2. The test equipment shall be equipped with pressure shut-off valve, filter, and a calibrated pressure gage to read required pressure value specified in 3.4.2 to an accuracy of ±.02 psi. Maintain the pressure within collimator for the period specified. Any drop in pressure as indicated on the pressure gage of the test equipment shall not exceed requirement specified in 3.4.2. The pressure shall then be reduced to zero psig (normal atmospheric pressure). The collimator shall then be flushed with nitrogen to the requirements of 3.4.2. The interior atmosphere shall be periodically sampled through a dew point meter until the atmosphere shows a dew point at least as low as -25 F. When this atmosphere is attained

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within the collimator, the collimator shall be sealed with an internal pressure of nitrogen at a pressure of between 0.25 and 0.50 psig at room temperature.

4.5.3 Optical.

4.5.3.1 Reticle lean. - Reticle lean test shall be performed with aid of a collimating telescope, hereafter referred to as auxiliary telescope; with a reticle plumbed and adjusted to infinity focus. Position the collimator in front of the auxiliary telescope so the optical axis are coincident. Align the zero verticle line image of the collimator parallel with the verticle reticle line of the auxiliary telescope. with the zero verticle line image of the collimator plumbed, the bubble of the level. vial shall be within the central graduation marks of the vial in accordance with the requirements of 3.4.3.1.

4.5.3.2 Reticle accuracy. - This test shall be accomplished with the aid of an auxiliary telescope and calibrated reticle pattern. The calibrated reticle pattern shall have a horizontal line 100 roils in length with vertical marks at the center and each end. A mil block at either end of the horizontal line will enable the observer to detect error. With the auxiliary telescope focused on the collimator reticle image, both 50 mil marks of the reticle image shall coincide within the allowable tolerance in accordance with the requirements of 3.4.3.2.

4.5.3.3 Parallax- This test shall be performecl with the auxiliary telescope positioned as specified in 4.5.3.1. Parrallax shall be removed from the auxiliary telescope by means of auto collimator. The test shall be made by sighting through the auxiliary telescope to the collimator center cross image. Parallax will be recognized as any apparent displacement of the collimator center cross image in relation to the auxiliary telescope reticle when the observer's head is moved from side to side, or up and down. Any movement of the observer's heal shall not cause displacement of the collimator center cross image to exceed the requirement specified in 3.4.3.3.

4.5.3.4 Cleanliness. - The optical system of the collimator unit shall be inspected for cleanliness in accordance with Specification MIL-O-13830 and 3.4.3.4 herein and shall meet the requirements specified. Dirt particles which interfere with the legibility or accuracy of the reticle pattern shall be cause for rejection. The mean diameter of a size 10 dig is equal to 0.10 millimeter.

4.5.3.5 Reticle illumination. Perform test under daylight conditions with the rear cover of collimator in an open position. Position a four power telescope at a distance of 15 feet (+6 inches) and then at 48 feet (-6 inches) from the objective lens of the collimator. At both positions view the collimator reticle through the telescope for compliance with paragraph 3.4.3.5. Repeat the above test in a completely darkened area; and with the rear cover closed

4.5.3.6 Collimated light output. - Perform this test by using a focusing photometer capable of producing readings in the microlamberts (10^{-3} footlamberts range). The photometer shall have an accuracy of $\pm 4\%$ and capable of repeating to better than $\pm 0.5\%$. The photometer will be calibrated on a six month basis using a radioluminus standard established by the United States Army Metrology and Calibration Center (USAMCC) at Redstone Arsenal,

A1. 35809. The radioluminus standard shall be made using the same phosphor as the lamp source and shall be returned to USAMCC on a six month cycle for recalibration prior to calibrating the photometer. The light output shall be performed by directing the photometer toward the supported item and separated at the specified working distance. The item under test shall be supported by an appropriate medium having a black background. Align and focus the receiving aperture of the photometer so that it covers no more than one-half of the smallest dimension on the radiating surface of the item under test and is centered on the surface. The radiating surface must also be perpendicular to the line of sight of the photometer. The measurement in microlamberts shall be equal to or exceed the minimum value specified. Perform this test in a dark room.

4.5.4 -Mechanical.

4.5.4.1 Elevation travel. - The elevation travel test shall be made by means of a wall chart located a suitable distance from the collimator. The chart shall have a plumbed line with a mark for the line of sight of the collimator and marks located 800 mils above and below the collimator line of sight mark. With legs fully extended in a horizontal position and the elevation clamping mechanism released, the collimator shall be elevated and depressed through the entire excursion indicated. Sighting of the collimator shall be accomplished by means of the open sight located on the collimator shall meet the minimum requirements Specified in 3.4.4.1.

4.5.4.2 Azimuth travel .- This test shall be made with the wall chart specified in 4.5.4.1. Sighting of the collimator shall be accomplished by means of the open sight located on the collimator. With open sight aligned with the plumbed line and the azimuth clamping mechanism released, the collimator shall be rotated 6400 mils and shall meet the requirements of 3.4.4.2.

4.5.4.3 Open sight. - This test shall be accomplished with the aid of an auxiliary telescope and a calibrated target. The center of the calibrated target shall be coincident with the optical line of sight of the auxiliary telescope and shall contain a one degree radius circle the center of which shall represent the center of the open sight of the collimator. With the collimator positioned in front of the auxiliary telescope as specified in 4.5.3.1 and the calibrated target located to the rear of the auxiliary telescope, the open sight shall read within the limits of the circle in compliance with the requirements of 3.4.4.3.

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4.5.4.4 Operability. - The collimator assembly shall be manually set up in the operational position from the carrying position. This shall be a visual and tactile examination of the collimator for conformance to the requirements specified in 3.4.4.4.

4.5.4.5 Knob travel. - There shall be a tactile examination for movement of the knobs to provide full locking and free movement of each specific component as specified in 3.4.4.5.

4.5.4.6 Knob locks -The locks shall be operable and shall prevent movement of locked items when exposed to the requirements of 3.4.1.2. At 60°F to 90°F, eight knobs of the collimator shall be locked by application of "Torque to Secure", values in Table I. There shall be no movement of locked items when the specified, "Test Values", are applied in conformance with the requirements of Table I. Torque and force values shall be applied with standard measuring equipment.

4.5.4.7 Telescope alignment. - The torque required to rotate the scope to center the level shall be measured with standard measuring equipment. The measured torque valued shall not exceed the values specified in 3.4.4.7 for the temperatures indicated.

4.5.4.8 Azimuth fine adjustment. - The torque required to operate the azimuth fine adjustment shall be measured with standard measuring equipment attached to the fine adjustment knob. The measured torque values shall not exceed 5 inch pounds of standard ambient temperature (+60°+ 90°F) and shall not exceed 10 inch pounds when exposed to extreme temperature, in accordance with the requirements of 3.4.4.8. The torque withstanding load test of the azimuth fine adjustment at each travel stop position (in and out), shall be measured with standard measuring equipment attached to the knob. At each temperatures specified in 3.4.4.8 rotate the azimuth fine adjustment to the travel stop position, then apply the specified 25 to 30 inch pound torque load to the knob. During this torque application there shall be no evidence of knob rotation. Upon return to standard ambient temperature, and subsequent to torque applications the azimuth fine adjustment knob shall be manually rotated in and out to each stop. During these rotations there shall be no tactile evidence threads. The azimuth fine adjustment shall conform to the requirements of 3.4.4.8.

4.5.4.9 Fastening devices. - The inspection of fastening devices shall be accomplished by means of a visual and tactile examination of catches or similar fastening devices used to secure the cover, to determine compliance with 3.4.4.9.

4.5.4.10 Carrying handle. - The carrying handle shall be inspected by a visual and tactile examination initially to determine compliance with 3.4.4.10. The collimator shall then be subjected to being lifted three feet from the ground and returned, at least 50 full cycles by means of the carrying handle. Subsequent to the lifting test, the handle assembly shall again be examined to determine any detrimental effects or indication of poor workmanship.

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4.5.4.11 Strap security.- The test shall be accomplished with a commercial fish scale attached to the strap and subjected to a direct pull as indicated in 3.4.4.11. After completion of the test, the strap shall be visually examined for any slippage or looseness of rivets, to determine compliance with the requirements of 3.4.4.11. The collimator shall then be subjected to the test. specified in 4.5.1.4 to determine compliance with 3.4.3.11.

4.5.4.12 Gasket. - The gasket shall have a visual and tactile examination to assure that there is proper adhesion to the cover as specified in 3.4.3.12.

5. PREPARATION FOR DELIVERY

5.1 Packaging, packing and marking. - Packaging, packing and marking shall be in accordance with Packaging Data Sheet 10556235. The level of protection shall be as specified in the procurement document.

6. NOTES

6.1 Intended use. - The Collimator Infinity Aiming Reference: M1E1 is an optical instrument on a tripod, with protective cover, intended to be used for indirect laying of field artillery weapons by establishing an optical reference which weapon deflection angles can be measure. It is a mil scale radioactive illuminated reticle which functions as an optical projection system simulating a grid board type of infinity target reference.

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

- Title, number and date of this specification.
- a. Applicable packaging data sheet number (see 5.1)
- c. Selection of applicable levels of preservation, packaging and packing.
- d. Applicable stock number.
- e. Requirement for First Article submission.

Custodian:

Army - AP

Preparing activity:

Army - AR
Project No. 1240-A623

FOLD

POSTAGE AND FEES PAID



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PENALTY FOR PRIVATE USE \$300

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DOCUMENT IDENTIFIER (Number) AND TITLE

MIL-C-48550 Collimator, Infinity Aiming Reference: MIAI

NAME OF ORGANIZATION AND ADDRESS OF SUBMITTER

☐ VENDOR ☐ USER ☐ MANUFACTURER

1. ☐ HAS ANY PART OF THE DOCUMENT CREATED PROBLEMS OR REQUIRED INTERPRETATION IN PROCUREMENT USE? ☐ IS ANY PART OF IT TOO RIGID, RESTRICTIVE, LOOSE OR AMBIGUOUS? PLEASE EXPLAIN BELOW.

A. GIVE PARAGRAPH NUMBER AND WORDING

B. RECOMMENDED WORDING CHANGE

C. REASON FOR RECOMMENDED CHANGE(S)

2. REMARKS

SUBMITTED BY (Printed or typed name and address — Optional)

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DD FORM 1426
1 OCT 76

EDITION OF 1 JAN 72 WILL BE USED UNTIL EXHAUSTED.

MIL-C-48550(AR)
 AMENDMENT 3
 22 May 1987

 SUPERSEDING
 AMENDMENT 2
 21 AUGUST 1981

MILITARY SPECIFICATION

COLLIMATOR, INFINITY AIMING REFERENCE: M1A1

This Amendment forms a part of Military specification MIL-C-48550 (AR), dated 15 August 1978, and is approved for use within the U.S. Army Armament, Munitions and Chemical Command and is available for use by all Departments and Agencies of the Department of Defense.

PAGE 3

* 3.4.1.1, line 3: Delete "-80°F'" and Substitute "-60°F".

PAGE 4

3.4.3.7: Add:

"3.4.3.7 External tritium contamination. Any part of tritium shall not be present on the external surfaces of the collimator in excess of 1000 dpm\100 sq. cm. subsequent to the requirement of 3.4.1.1 through 3.4.1.4".

PAGE 5

3.4.4.7, line 3: Delete "eight inch pounds" and substitute "three inch pounds".

PAGE 6

4.3.2.2, line 2: delete "IV"

PAGE 7

TABLE II, Following Characteristic 119, insert:

| | | | |
|-------|----------------------------|---------|----------|
| "120. | Collimated Light Output | 3.4.3.6 | 4.5.3.6 |
| 121. | Radiological Contamination | 3.4.3.7 | 4.5.3.7" |

AMSC N/A

1 of 2

FSC 1240

DISTRIBUTION STATEMENT A. Approval distribution is unlimited

MIL-C-48550(AR)
AMENDMENT 3

PAGE 8

4.3.2.2.1.1, line: Delete "or IV".

PAGE 9

* 4.5.1.1, line 5: Delete "-80°F" and substitute "-60°F".

PAGE 11

4.5.3.7, Add:

4.5.3.7 Radiological contamination. Contamination test shall be performed by wiping the collimator with filter paper moistened in distilled water. The wiping shall be performed with moderate finger pressure. The damp filter paper shall be placed in a container with the proper portion of scintillation liquid. The scintillating system used to measure contamination must be calibrated. The readout shall be within 10% of the known standard value when counted to a total of 2000 disintegrations. The actual test for determining contamination is performed by placing the container into the scintillating system. The measured contamination shall be within the limits specified in 3.4.3.7".

The margins of this amendment are marked with an asterisk or vertical line to indicate where changes (additions, modifications, corrections, deletions) from the previous amendment were made. This was done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content irrespective of the marginal notations and relationship to the last previous amendment.

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