MILITARY SPECIFICATION

TRIPOD, PHOTOGRAPHIC LM-41( )

This specification is approved for use by the Electronics Research and Development Command, Department of the Army, and is available for use by all departments and agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification covers the requirement for one type of medium duty tripod with pan and tilt head, and carrying case, designated Tripod, Photographic LM-41( ) (see 6.4).

2. APPLICABLE DOCUMENTS

2.1 Government documents.

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

SPECIFICATIONS

MILITARY

MIL-M-13231	- Marking Of Electronic Items.
MIL-F-14072	- Finishes For Ground Electronic Equipment.
MIL-E-55565	- Electronics Equipment And Parts, Packaging Of.

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 Electronics Research and Development Command, ATTN: DELSC-PE, Fort Monmouth, New Jersey 07703-5304, by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

STANDARDS

MILITARY

MIL-STD-105 - Sampling Procedures And Tables for Inspection By Attributes.

MIL-STD-252 - Wired Equipment, Classification of Visual And Mechanical Defects.

MIL-STD-454 - Standard General Requirements for Electronic Equipment.

MIL-STD-726 - Packaging Requirements Code.

MIL-STD-810 - Environmental Test Methods.

2.1.2 Other Government documents. The following Government drawings form a part of this specification to the extent specified herein:

DRAWINGS

ELECTRONICS COMMAND

SC-DL-78130 - Tripod, Photographic LM-41( )

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

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

3. REQUIREMENTS

3.1 Description. The tripod is of light to medium construction, designed particularly for use with motion picture and hand-held cameras.

3.2 First article. Unless otherwise specified in the contract, a sample shall be subjected to first article inspection (see 4.3 and 6.2b).

3.3 Material. The material shall be as specified herein and as shown on the applicable drawings. However, when a definite material is not specified, a material shall be used which will enable the tripod to meet the performance requirements of this specification. Acceptance or approval of any constituent material shall not be construed as a guaranty of the acceptance of the finished product.

3.3.1 Recycled material. It is encouraged that recycled material be used, when practical, provided it meets the requirements of this specification.

3.4 Construction. The equipment shall be constructed in accordance with Drawing and Data List SC-DL-78130 and drawings listed therein, and as specified herein.

3.5 Operational. Under a simulated camera load up to 30 pounds (13.6kg) and at any column height from 44 inches (1.12m) to 73 inches (1.85m), the tripod shall have no lateral or horizontal sway, no warpage or slipping of legs, no binding of thumb screws or leg clamps or other moving parts, and shall have positive locking of leg locking clamps. The operation of the panhandle shall be a smooth and continuous movement without causing lateral or horizontal sway in the tripod.

3.6 Environmental.

3.6.1 Temperature.

3.6.1.1 Operating. The tripod shall operate in any ambient temperature from +30°F to +120°F (-1.1°C to +49°C) without damage, performance degradation or malfunction.

3.6.1.2 Storage. The tripod shall withstand any ambient storage temperature from -40°F to +160°F (-40°C to +71°C) for 12 hours without damage, performance degradation, or malfunction.

3.6.2 Humidity. When tested as specified in 4.6.3, the tripod and its carrying case shall exhibit no physical damage, such as corrosion, rust, blistering, swelling or deterioration of parts and materials.

3.6.3 Fungus. When tested as specified in 4.6.4, the tripod and its carrying case shall be visually examined using a 10-power magnifier. The tripod and the case shall each show no more than six minute unrelated spots, each no greater than 0.015 square inch (9.68mm^2) in area of sparse microbial growth as evidenced by growth colonization, which includes branching and sporulation on or within each cubic foot (0.028m^3), or fraction thereof, of equipment assembly volume (see 6.6). Isolated instances of partial tubular germination (see 6.6) shall not be included in this evaluation.

3.7 Interchangeability. Like units, assemblies, subassemblies and replaceable parts shall conform to requirement 7 of MIL-STD-454.

3.8 Finish. The tripod shall be finished in accordance with MIL-F-14072 and the drawings.

3.9 Marking.

3.9.1 General. Marking shall conform to MIL-M-13231 and the drawings.

3.9.2 Visibility. Wherever practicable, parts shall be so mounted that identification markings will be readily visible with minimum disassembly of the equipment.

3.9.3 Serial numbers. Each tripod shall have a serial number on its nameplate.

3.10 Workmanship. The tripod shall be manufactured and assembled in accordance with requirement 9 of MIL-STD-454 and shall be free from the applicable defects listed in MIL-STD-252.

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 own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

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

a. First article inspection (see 4.3).

b. Inspection covered by subsidiary document (see 4.4).

c. Quality conformance inspections (see 4.5).

d. Packaging inspection (see 4.9).

4.3 First article.

4.3.1 First article units. When specified in the contract, the contractor shall furnish first article units of the complete tripod as required (see 6.8).

4.3.2 First article inspection. The first article inspection shall consist of the inspections specified in subsidiary documents covering the items listed in 4.4, and the inspections specified for group A, group B, and group C. The inspection shall be performed in the order as stated above. After completion of group C environmental tests, conforming units shall be reinspected and shall pass all group A inspection. Failure of any inspection shall be cause for rejection of the first article.

4.4 Inspection covered by subsidiary document. The following shall be inspected under the applicable subsidiary documents as part of the inspection required by this specification before packaging:

Item	Where required
Finish	3.8
Marking	3.9

4.5 Quality conformance inspection. The contractor shall perform the inspection specified in 4.4 and 4.5.1 through 4.5.4. This does not relieve the contractor of his responsibility for performing any additional inspection which is necessary to control the quality of the product and to assure compliance with all specification requirements.

4.5.1 Group A inspection. Each unit shall be inspected for conformance to the inspections specified in table I. Discrete lots shall be formed from units that pass this inspecion. Factors of lot composition not defined herein, shall be in accordance with MIL-STD-105. Each lot shall be subject to sampling inspection, utilizing the procedures of MIL-STD-105, using the general inspection levels, and acceptance quality levels (AQL) indicated in table I.

TABLE I. Group A inspection.

Inspection	Requirement paragraph	Test method paragraph	AQL (percent defective)	
			Major	Minor
Visual and mechanical	3.10	4.6.6	1.5	6.5
No-load operational	3.5	4.6.1.1	1.0	1/
Weight-load operational	3.5	4.6.1.2	1.0	1/

1/ All defects shall be considered major.

4.5.1.1 Order of inspection within Group A. Group A inspection shall be performed in an order satisfactory to the Government.

4.5.2 Group B inspection. Group B inspection shall normally be performed on inspection lots that have passed group A inspection and on samples selected from units that have been subjected to and met the group A inspection. This inspection shall consist of the inspection for dimensional interchangeability. The AQL shall be 6.5 percent defective and special inspection level S-4 shall be used.

4.5.3 Group C inspection. Group C inspection shall be performed on units that have passed group A and group B inspections. The inspection shall consist of the inspection specified in table II. Sample shall be selected in accordance with 4.5.3.1.

TABLE II. Group C inspection.

Inspection	Requirement paragraph	Test paragraph
Low temperature	3.6.1.1, 3.6.1.2	4.6.2.1
High temperature	3.6.1.1, 3.6.1.2	4.6.2.2
Humidity	3.6.2	4.6.3
Fungus	3.6.3	4.6.4

4.5.3.1 Sampling for inspection. One sample shall be selected at random for all inspection in table II from every 100 and fraction thereof produced. The first samples selected shall be at the start of the contract from the first conformance inspection lot.

4.5.3.2 Order of inspection within group C. Group C inspection shall be performed in accordance with the order shown in table II.

4.5.3.3 Group C failures. Actions required relative to group C failure shall be as specified in the contract (see 6.2c).

4.5.4 Reinspection of conforming group C sample units. Unless otherwise specified, sample units which have been subjected to and passed group C inspection may be accepted on the contract provided all damage is repaired and the sample units are resubjected to and pass group A inspection.

4.6 Methods of inspection.

4.6.1 Operational tests.

4.6.1.1 No-load test. The tripod shall be set up for operation at each of the three column heights: 44 inches (1.12m), 60 inches (1.52m), and 73 inches (1.85m). In each position, the panhandle shall be moved 180° in the horizontal plane in one continuous motion and then locked in place. Then, unlock and move the panhandle 45° up from the horizontal plane and then lock it in place. Nonconformance to 3.5 shall constitute failure of this test.

4.6.1.2 Weight-load test. The tripod, with a load of 30 ±1.5 pounds (13.6 ±0.7kg), shall be set up for operation at each of the three column heights: 44 inches (1.12m), 60 inches (1.52m), and 73 inches (1.85m). In each position, the panhandle shall be moved 180° in the horizontal plane in one continuous motion and then locked in place. The panhandle shall then be unlocked and moved 45° up from the horizontal plane and then be locked in place. For the condition in which the tripod is at column height of 73 inches (1.85m), the tripod shall stand for an additional 5 minutes subsequent to the 45° angle setting to demonstrate conformance to the requirements of 3.5. Nonconformance to 3.5 shall constitute failure of this test.

4.6.2 Environmental.

4.6.2.1 Low temperature. The tripod, out of its carrying case, shall be tested as specified in method 502.1, procedure I of MIL-STD-810. The storage temperature shall be -40°F (-40°C) for a period of 12 hours and the operating temperature shall be +30°F (-1.1°C). Nonconformance to 3.6.1 shall constitute failure of this test.

4.6.2.2 High temperature. The tripod, out of its carrying case, shall be tested as specified in method 501.1, procedure II of MIL-STD-810. The storage temperature shall be +160°F (+71°C) and the operating temperature shall be +120°F (+49°C). Nonconformance to 3.6.1 shall constitute failure of the test.

4.6.3 Humidity. The tripod shall be subjected to the humidity test specified in method 507.1, procedure II of MIL-STD-810, with test measurements during step 4 and the last 5-hour period of the fifth 48-hour cycle in step 6. The case, in a closed condition, shall also be subjected to these humidity-temperature conditions. Inability of the tripod or the case to meet the requirements of 3.6.2 at the conclusion of step 6 shall constitute failure of this test.

4.6.4 Fungus. The tripod and interior of the case shall be subjected to the fungus test specified in method 508.1, procedure I, of MIL-STD-810. There shall be abundant growth colonization (see 6.6) on 50 percent or more of the area of the control item after 14 and 28 days. No cleaning of the equipment is permitted for 72 hours prior to the fungus test. Handling, prior to and during testing, shall be accomplished without contamination of the equipment. Nonconformance to 3.6.3 shall constitute failure of this test.

4.6.5 Dimensional interchangeability. The dimensions shown on the drawings shall be gaged or measured to determine compliance to the interchangeability requirement of 3.7. When a specimen is not within specified limits it shall be considered a major defect.

4.6.6 Visual and mechanical inspection. Equipment shall be examined for compliance with requirement 9 of MIL-STD-454 and for freedom from applicable defects specified in MIL-STD-252. Nonconformance to 3.10 shall constitute failure of this test.

4.7 Packaging inspection. Packaging inspection requirements specified herein are classified as follows:

a. First article inspection of packaging

b. Quality conformance inspection of packaging

4.7.1 First article inspection of packaging. Unless otherwise specified in the contract, first article inspection of packaging shall be in accordance with the unit pack design validation requirements of MIL-P-116.

4.7.2 Quality conformance inspection of packaging.

4.7.2.1 Materials inspection. All materials to be used in packaging shall be inspected in accordance with the applicable material specification.

4.7.2.2 Preservation inspection. Inspection of preservation and interior markings shall be in accordance with group A and B quality conformance inspection requirements of MIL-P-116. Lot formation and sampling procedures shall be as specified therein.

4.7.2.3 Packing inspection. Inspection of packing and the marking for shipment and storage shall consist of the examinations specified in table III, "Packing inspection provisions." Lot formation shall consist of all packs made of the same materials during an identifiable period and submitted at one time for acceptance. Sampling procedures shall be in accordance with MIL-STD-105, using a single sampling plan and acceptable quality level of 4.0 percent defective.

TABLE III. Packing inspection provisions.

No.	Characteristic	Method of inspection
101	Intermediate container not as specified.	Visual
102	Improper closure of intermediate container.	Visual
103	Shipping containers not in accordance with specification.	Visual
104	Excessive cube.	Visual
105	Improper blocking and bracing	Visual
106	Closure not in accordance with specification.	Visual
107	Weight and size exceed container limitations.	Weight & measure
108	Strapping not in accordance with specification, incorrectly applied, or omitted.	Visual
109	Marking omitted, incorrect, or illegible.	Visual

5. PACKAGING

5.1 Preservation. Preservation shall be specified in MIL-STD-726, coded as follows:

5.1.1 Level A. 10-1-1-00-00-NS-X-ED-0-00-A.

5.1.2 Level B. 10-1-1-00-00-NS-X-ED-0-00-B.

5.2 Packing and marking. Packing and marking shall be in accordance with MIL-E-55585.

6. NOTES

6.1 Intended use. The tripod is a photographic accessory item designed particularly for use with motion picture cameras of light and medium weight in order to increase the operational range of these hand-held cameras for field photography and semi-production use. This tripod is also suitable for use in extending the operational range of still picture cameras.

6.2 Ordering data. Acquisition documents should specify the following:

a. Title, number, and data of this specification.

b. When a first article is required for inspection and approval, and number of units required (see 3.2).

c. Group C failure action (see 4.5.3.3).

d. Level A or B preservation and packing (see section 5).

e. When first article inspection rough handling tests are not required.

f. When first article packaging inspection test reports require acquisition activity approval prior to production unit packing.

6.3 First article. When a first article inspection is required, the item will be tested and should be a preproduction model. The first article should consist of one or more units. The contracting officer should include specific instructions in acquisition documents regarding arrangements for examination tests, and approval of first article.

6.4 Nomenclature. The parentheses in the nomenclature will be deleted or replaced by a letter identifying the particular design; for example, LM-41W. The contractor should apply for nomenclature in accordance with the applicable provision in the contract (see 1.1).

6.5 Group C inspection. Approval to ship may be withheld, at the discretion of the Government, pending the decision from the contracting officer on the adequacy of the corrective action (see 4.5.3.3).

6.6 Definitions.

6.6.1 Branching. Branching is a connected arrangement of filaments (hyphae) formed by shoots or secondary stems growing from the main stem or filament (hypha).

6.6.2 Growth Colonization. Growth colonization is a mass of individual plants, generally of on species, living together; or a group of hyphae which is formed from one spore or cell and may be one individual plant. Colonization which completely covers the surface of the nutrient material constitutes abundant growth.

6.6.3 Microbial growth. Microbial growth is the growth of very minute organisms. Such organisms, when present in large numbers, may provide a colony visible to the naked eye.

6.6.4 Sporulation. Sporulation is the formation of minute unicellular reproductive or dormant bodies, called spores.

6.6.5 Tubular germination. Tubular germination is partial growth by the production of hyphae, which are tubular shaped fungal filaments. Tubular germination constitutes restricted individual spore growth not proceeding to colonization.

6.7 Level B preservation. When level B preservation is specified, this level of protection will only be used under known favorable conditions during transportation, storage and handling.

6.8 Environmental. Environmental pollution prevention measures are contained in the packaging material specifications referenced herein. Refer to material specifications or preparing activity for recommended disposability methods.

6.9 Changes from previous issue. Asterisks are not used in this revision to identify changes with respect to the previous issue due to the extensiveness of the changes.

Custodian:
Army - ER

Review activity:
DLA - GS

User Activity:
Army-MI

Preparing activity:
Army - ER
(Project 6760-A584)

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

(See Instructions – Reverse Side)

1. DOCUMENT NUMBER

2. DOCUMENT TITLE

3a. NAME OF SUBMITTING ORGANIZATION

b. ADDRESS *(Street, City, State, ZIP Code)*

4. TYPE OF ORGANIZATION *(Mark one)*

- ☐ VENDOR
- ☐ USER
- ☐ MANUFACTURER
- ☐ OTHER *(Specify)*: _____

5. PROBLEM AREAS

a. Paragraph Number and Wording:

b. Recommended Wording:

c. Reason/Rationale for Recommendation:

6. REMARKS

7a. NAME OF SUBMITTER *(Last, First, MI)* – Optional

b. WORK TELEPHONE NUMBER *(Include Area Code)* – Optional

c. MAILING ADDRESS *(Street, City, State, ZIP Code)* – Optional

8. DATE OF SUBMISSION *(YYMMDD)*

(TO DETACH THIS FORM, CUT ALONG THIS LINE.)

DD FORM 82 MAR 1426

PREVIOUS EDITION IS OBSOLETE.