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	DRAWN: Robert Schmucker	TITLE LIGHTWEIGHT TACTICAL (CABLE) REEL STAND RL-309/U			
	CHECKED: Robert Schmucker				
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	REVIEWED: Melissa Fox	SIZE A	CODE IDENT NO. 80063	A3354296	
	APPROVED: Kate McDevitt				
	DATE: 14 JUL 2016	SCALE NONE		SHEET 1 of 10	

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PERFORMANCE SPECIFICATION

LIGHTWEIGHT TACTICAL (CABLE) REEL STAND RL-309/U

This specification is approved for use by the USA CECOM, 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 a lightweight, portable, hand operated reel unit designated as Reel Stand, Lightweight Tactical, RL-309/U (see 6.1).

2. APPLICABLE DOCUMENTS

2.1. General. The documents listed in this section are specified in sections 3 and 4 of this specification. This section does not include documents cited in other sections of this specification or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements documents cited in sections 3 and 4 of this specification, whether or not they are listed.

A3159879 CABLE, FIBEROPTIC, RUGGEDIZED, RADIATION HARDENED (METRIC) AND NON-RADIATION HARDENED

A3336463 PERFORMANCE SPECIFICATION / ITEM SPECIFICATION FOR THE REEL, CABLE, LIGHT-WEIGHT TACTICAL

MIL-R-3241 DETAIL SPECIFICATION - REELS, CABLE (REELS DR-5(), DR-7(), DR-B(), RC-453()/G, RL-159()/U)

MIL-STD-130 IDENTIFICATION MARKING OF U.S. MILITARY PROPERTY

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to:
Commander, U.S. Army Communications-Electronics Command, ATTN: RDER-PRC-CM, Building 6010, K2-228-A, Aberdeen Proving Grounds, MD, 21005 by using the Standardization Document Improvement Proposal (DD Form 1426)

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Non-Government publications. The following document(s) form a part of this specification to the extent specified herein. Unless otherwise specified, the issues of the documents which are Department of Defense (DoD) adopted are listed in the issue of the Department of Defense. Index of Specifications and Standards (DoDISS) cited in the solicitation. Unless otherwise specified, the

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issues of documents not listed in the DoDISS are the issues of the documents cited in the solicitation. (See 6.2).

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI/ASQC Z1.4 - Sampling Procedures and Tables for Inspection of Attributes

(Application for copies should be addressed to the American National Standards Institute, 11 West 42nd Street, New York, NY 10036)

2.2. Order of precedence. In the event of a conflict between the text of this document and the reference cited herein, the text of this document shall take precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1. First article. When specified (see 6.3), a sampling shall be subjected to first article inspection. First article inspection shall not be required if the contractor has supplied the equipment for any government contract within the prior twenty-four (24) months.

3.2. Design, materials, and manufacturing. Unless otherwise specified, the design materials, and manufacturing process selection is the prerogative of the contractor provided all articles submitted to the government fully meet the interface and operating environment requirements specified in this document. All materials used in the reel stand shall be corrosion resistant.

3.3. Finish, protective. The frame and flat aluminum surfaces other than the axle, brake housing and axle crank handle shall be finished in a dull lusterless finish to be available in desert tan, olive drab or black. Chemical Agent Resistant Coatings (CARC) shall be available as an option. The axle, brake housing and hand crank finish shall be flat (non-glossy).

3.4. Weight. The weight of a standard configuration reel stand with dual axle, two brake assemblies, two hand cranks and pouch shall not exceed 22 pounds.

3.5. Marking. Marking the reel stand and replaceable/spare parts and assemblies shall be per MIL-STD-130.

3.6. Operating requirements. Each unit shall provide the following functional, operational, and performance capabilities:

3.6.1. Axle. The axle shall be square and compatible with cable reels commonly used including MIL-R-3241E (DR-5, DR-7, DR-8), RFO-100, RFO-300, RFO-500, RFO-1000, and CECOM Specification A336463 series reels and similar reels which employ a square drive axle. A dual-axle configuration shall be available to accommodate two reels and allow for independent operation of the reels in either direction or both directions simultaneously. The dual-axle shall include reel stops for mounting smaller reels. The axle shall accommodate hand cranks from the RL-31 Reeling Machine.

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3.6.2. Brake(s). The reel stand shall come with one or two friction brake units capable of controlling the rate of axle rotation during deployment of the cable. Installation or removal of the brake assemblies shall not require tools. When tested in accordance with 4.8, the brake shall bring each Reel AFO-1000 fully loaded with A3159879 TFOCA cable (or equivalent), to a smooth stop from a speed of 500 rpm within 3 seconds.

3.6.3. Hand Crank(s). The reel stand shall come with one hand crank for the single axle configuration and two hand cranks for the dual-axle configuration. The hand crank shall attach to the axle without need for any tools.

3.6.4. Bi-directional operation. The reel stand shall be capable of deploying or retrieving cable in both forward and backward directions (relative to the position of the reel stand) without tipping over and without using stakes to secure legs to the ground.

3.6.5. Frame. The frame shall be able to be configured as a ground / mobile fixed (A-frame), wheel barrow (rolling) or litter carry (flat extended) during normal operations. For transport or storage, the frame shall fold to a flat position. The frame shall support a minimum of 150 pounds of cable / reel weight in the litter position. All positions, including transport, shall be capable of being secured without need for tools to prevent damage to equipment or injury to personnel. The frame shall include handles for use of the reel stand in a litter carry position and be able to be staked to the ground using separate stakes to be provided with the reel stand (quantity 6, including 2 spare stakes).

3.6.6. Axle mount. The axle mount shall include user replaceable bearings and allow for installation or removal of the axle or bearings without tools and securely hold the axle in place during operation. No lubrication shall be required for operation.

3.6.7. Storage pouch. A storage pouch shall be attached to the frame for holding brake assemblies and reel crank handles during transport, and stakes for securing the reel stand to the ground, spare attachment hardware and miscellaneous tools (not provided with the reel stand).

3.7. Interchangeability. Like units, assemblies, subassemblies and replaceable parts should fit all other units so that they are useable with other units; i.e., physically and functionally interchangeable without modification.

3.8. Operational. When testing in accordance with section 4.15, the Lightweight Tactical Reel Stand shall perform satisfactorily. There shall be no binding or seizing of the axle and brakes shall smoothly stop the rapidly turning loaded reel of cable.

3.9. Operational Life. The equipment shall be capable of continuous operations as specified in sections 3.6, 3.7 and 3.8. The equipment shall be tested per section 4.16 and meet the requirement of section 3.7.

3.10. Environmental Conditions.

3.10.1. Rain. The equipment shall meet specified performance during and after exposure to blowing rain and drip.

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3.10.2. Moisture resistance. The equipment shall be examined 24 hours after the test specified in section 4.17.2 and there shall be no evidence of corrosion, or any other form of deterioration. The equipment shall then meet the requirements of section 3.8.

3.10.3. Salt fog. The equipment shall be examined 24 hours after the test specified in section 4.17.3 and there shall be no evidence of corrosion that would impede performance or any other form of deterioration that would impede performance. The equipment shall then meet the requirements of section 3.8.

3.10.4. Temperature. The equipment shall perform satisfactorily when tested per 4.17.4 and meet the requirements of section 3.8 at the steps specified.

3.10.5. Vibration. The equipment shall have no mechanical resonance below 55 cycles per second when tested per section 4.17.6 and shall meet the requirements of section 3.8.

3.10.6. Technical literature. Technical literature shall be furnished as specified in the contract.

4. VERIFICATION

4.1. Classification of inspections

4.1.1. First article inspection (see section 4.3.1)

4.1.2. Conformance inspection (see 4.3.2)

4.2. Verification methods. The types of verification methods included in this section are visual inspection, measurement, sample tests, full scale demonstration tests, simulation, modeling, engineering evaluation, component properties analysis, and similarity to previously qualified designs.

4.2.1. Verification alternatives. The manufacturer may propose alternate test methods, techniques, or equipment, including the application of statistical process control, or cost-effective sampling procedures, to verify performance. See the contract for alternatives that replace verifications required by this specification.

4.3. Order of inspection. Perform visual inspection of samples first.

4.3.1. First article inspection. First article inspection shall be performed on the first seven (7) units which have been produced with equipment and procedures used in production (production-representative units) when a first article sample is required (see section 3.1).

4.3.2. Conformance inspection. Conformance inspection shall include those examinations and tests from Table 1 as defined in the contract.

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TABLE I. Verification Table

Inspection	Requirement Paragraph	Test Paragraph
Finish	3.3	4.4
Weight	3.4	4.5
Marking	3.5	4.6
Axle	3.6.1	4.7
Brake(s)	3.6.2	4.8
Hand Crank(s)	3.6.3	4.9
Bi-directional operation	3.6.4	4.10
Frame	3.6.5	4.11
Axle mount	3.6.6	4.12
Storage pouch	3.6.7	4.13
Interchangeability	3.7	4.14
Operation	3.8	4.15
Operational Life	3.9	4.16
Rain	3.10.1	4.17.1
Moisture resistance	3.10.2	4.17.2
Salt fog	3.10.3	4.17.3
Temperature	3.10.4	4.17.4
Vibration	3.10.5	4.17.5
Visual & Mechanical Insp.		4.18

4.4. Finish inspection. Inspect externally visible colors of all materials to be dark color (i.e., black, olive drab, brown, etc.) to facilitate existing military camouflage schemes. Make 10 measurements at different points on the system surface using a 60 degree gloss meter. Confirm that the average value of these readings does not exceed ten percent.

4.5. Weight. The reel stand shall meet the requirements of section 3.4.

4.6. Marking inspection. The reel stand marking shall meet the requirements of section 3.5 and shall be legible after exposure to environmental testing / conditions. It is permissible to wipe the markings with a damp or dry rag to clean off any residue from exposure to the environment.

4.7. Axle. The reel stand axle shall meet the requirements of section 3.6.1 with both steel and high strength polymer reels samples to be provided by the Government as government furnished equipment (GFE).

4.8. Brake. With axle loaded with 2 reels AFO-300 or equivalent, each loaded with 300 meters of A3159879-4 (4 channel TFOCA) or equivalent fiber optic cable, apply pressure to the lever handle of each brake when turning 500 rpm.

4.9. Hand crank(s). Hand cranks shall meet the requirements of section 3.6.2 with both bare and gloved hands. With axle loaded with 2 reels AFO-300 or equivalent, each loaded with 300 meters of A3159879-4 (4 channel TFOCA) or equivalent fiber optic cable, the crank shall be placed on each end of the axle and rotated. The reel stand shall meet the requirements of section 3.6.3.

4.10. Bi-directional operation. The reel stand shall meet the requirements of sections 3.6.4 using both 300 meter and 1km full reels loaded with A3159879-4 (4 channel TFOCA) or equivalent fiber optic cable.

4.11. Frame. The reel stand shall meet the requirements of section 3.6.5. All operational positions shall be demonstrated using both 300 meter and 1km full reels loaded with A3159879-4 (4 channel TFOCA) or equivalent fiber optic cable.

4.12. Axle mount. The reel stand shall meet the requirements of section 3.6.6. Security of the axle shall be demonstrated using both 300 meter and 1km full reels loaded with A3159879-4 (4 channel TFOCA) or equivalent fiber optic cable during Bounce and Vibration tests.

4.13. Storage pouch. The reel stand storage pouch shall meet the requirements of section 3.6.7 and shall not show any signs of damage after exposure to environmental conditions of section 3.10.

4.14. Interchangeability (Inspection for dimensional interchangeability). The dimensions listed below shall be gauged or measured to determine conformance to the physical interchangeability requirement of section 3.7. When a listed dimension is not within specified or design limits, it shall be considered a major defect.

4.14.1. Hand Crank – ½-13 UNC-2A Thread.

4.14.2. Brake – I.D. 1-1/32” square hole ± 1/64”.

4.14.3. Axle – 1” square ± 1/64”

4.15. Operation. The reel stand, loaded with two reels AFO-300 or equivalent, each loaded with 300 meters of A3159879-4 (4 channel TFOCA) or equivalent fiber optic cable, shall be operated to simulate paying out cable at a speed of 2200 feet per minute. Each reel shall be rotated with the other reel held stationary until the cable is completely paid out and meet the requirements of section 3.8.

4.16. Operational life. Four reel stands, loaded per section 3.6.1, shall be operated to simulate paying out cable at a speed of 1,320 feet per minute. Each reel shall be rotated separately. Each reel shall be run continuously for 6 hours and meet the requirements of section 3.9.

4.17. Environmental conditions.

4.17.1. Rain. The reel stand shall be tested in all the configurations for blowing rain and water tightness. The rainfall rate may be tailored to the anticipated deployment local and duration. A minimum rate of 10 cm/hr (4 in/h) is recommended. For these tests, droplet sizes should be predominantly in the range of approximately 0.5 mm in diameter (which is considered to be mist or drizzle rather than rain). Wind driven rain gusts in excess of 18 m/s may be required to satisfy the test requirement. Test the reel stand on vertical surfaces rather than horizontal surfaces.

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4.17.2. Moisture resistance. Subject a reel stand to natural cyclic high humidity conditions under randomly varied temperatures between 79°F and 95°F with relative humidity randomly varied between 79% and 95% over a 24 hour period. Stabilize the reel stand at ambient conditions for another 24 hours.

4.17.3. Salt fog. The Lightweight Tactical Reeling Machine shall be exposed to salt-fog conditions consistent with MIL-STD-810F Method 509.4 Salt Fog. The assembly shall not exhibit any abnormal nicks, cracks, or scratches that indicate the removal of the normal protective coatings after short term exposure.

4.17.4. Temperature. Complete a test for high and low temperature as follows:

4.17.4.1. High temperature. Test for operation between natural ambient and 126°F for a period of 72 hours. Test for storage and transportation between natural ambient and 160°F for 168 hours. Operation testing shall be performed after exposure and meet the requirements of section 3.8.

4.17.4.2. Low temperature. Test for operation between natural ambient and -26°F for a period of 24 hours. Test for storage and transportation between natural ambient and -31°F for 52 hours. Operation testing shall be performed after exposure and meet the requirements of section 3.8.

4.17.5. Vibration. The reel stand shall be tested as follows to determine compliance with section 3.10.5. Hand cranks, brake assemblies and the storage pouch will be removed prior to the test. The test configuration shall not include a cable assembly.

4.17.5.1. The reel stand shall be fastened in its normal mounting position on a vibration table that can be controlled within 10% of its specified amplitude and shall follow the test procedure specified in MIL-STD-810G, Method 514.7C, Category 4 (Typical Mission/field transportation scenario), Procedure I (General Vibration) for a Composite Wheeled Vehicle (CWV).

4.17.5.2. The reel stand shall be vibrated successively in three (3) mutually perpendicular directions that are parallel respectively to the edges of the reel stand, over a frequency of 10 – 55 cycles per second, in a cycle per second steps and maintain each frequency for at least 10 seconds.

4.17.5.3. Mechanical resonance, if any, of the complete structure, of subassemblies, and of component parts shall be determined visually by means of a Strobotac, as made by the General Radio Corporation, Cambridge, MA, or equal, or by other means, provided that vibration of the part is not affected by the measurement.

4.18. Visual and mechanical. The reel stand shall be examined for defects listed in Table II.

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TABLE II. Classification of visual and mechanical defects

Classification	Defects
MAJOR	• Misalignment of reel shaft • Poor welds • Brake not operating correctly after all adjustments are made • Bent supports • Axle not spinning freely, binding or jamming. • Parts not complete
MINOR	• Brake adjustment not correct • Improperly assembled • Painting not complete • Flaking or peeling of paint • Small scratches

5. PACKAGING

5.1. Packaging. For acquisition purposes, the packaging requirements shall be specified in the contract or order (see 6.2). When actual packaging of material is to be performed by DOD personnel, these personnel need to contact the responsible packaging activity to ascertain requisite packaging requirements. Packaging requirements are maintained by the Inventory Control point's Department's System Command. Packaging data retrieval is available from the managing Military Department's or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity.

6. NOTES

This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.

6.1 Intended Use. The Lightweight Tactical Reel Stand is a lightweight, portable hand operated reel unit used in paying out and recovering copper and fiber optic cable on cable reels commonly used including MIL-R-3241E (DR-5, DR-7, DR-8), RFO-100, RFO-300, RFO-500, RFO-1000, and CECOM Specification A336463 series reels (RLW-XXX including AFO-100, AFO-300, AFO-500, AFO-750, AFO-1000) and similar reels which employ a square drive axle.

6.2 Acquisition documents. Acquisition documents should specify the following:

- Title, number, and date of this specification and any amendment.
- Issue of the DoDISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced.
- When a first article is required (see 3.1, 4.3.1, and 6.3).
- Sample plans for verification inspection and test. For general information only;

Sampling in past procurements using a detailed design specification was conducted using MIL-STD-105. However, MIL-STD-105 is canceled and replaced by American National Standard, ANSI/ASQC Z1.4.

- e. When conformance verification is required (see 4.3.2 and 6.4).
- f. Packaging requirements (see 5.1).
- g. The parentheses in the nomenclature will be deleted or replaced by a letter identifying the particular design; for example: AN/AVS-6(V)(3). The contractor should apply for nomenclature according to the applicable contract clause.

6.3 First article. When requiring a first article inspection, contracting documents shall provide specific guidance to offerors. This guidance should cover whether the first article is a first article sample, a first production item, or the number of test items. These documents should also include specific instructions regarding arrangements for examinations, approval of first article test results, criticality of test results, and disposition of first articles. Pre-solicitation documents should provide Government waiver rights for samples for first article inspection to bidders offering a previously acquired or tested product. Bidders offering such products who wish to rely on such production testing must furnish evidence with the bid that prior Government approval is appropriate for the pending contract.

6.4 Conformance inspection. Affordable conformance inspection with confidence varies depending upon a number of procurement risk factors. Some of these factors include: contractor past performance, government schedules and budget, product material and design maturity, manufacturing capital equipment and processes applied, the controlled uniformity of those processes, labor skill and training, and the uniformity of measuring processes and techniques. During the solicitation, contracting documents should indicate those tests desired from Table I and their designated frequency based on a risk assessment for the procurement.

6.5 Drawings. Offerors will provide a drawing package showing the information of their design (major assemblies and part numbers) as required. The Government does not own the rights to a drawing package unless otherwise indicated.

6.6 Subject term (key word) listing.

Axle
Brake
Crank

6.7 Changes from previous issue. Marginal notations are not used in this revision to identify changes with respect to the previous issue due to the extent of the changes.

Custodian: Preparing activity

Army- USA RDECOM Product Realization, Engineering & Quality Directorate, RDER-PRC-CM

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