

MIL-C-55462(EL)  
18 January 1966

## MILITARY SPECIFICATION

CABLE, TELEPHONE WD-36( )/TT  
DISPENSER, CABLE MX-6894( )/TT and  
DISPENSER, CABLE MX-6895( )/TT

## 1. SCOPE

1.1 Scope.- This specification covers an ultra-lightweight assault, parallel-pair of solid aluminum conductors, polyethylene insulated, for voice frequency telephone cable, designated as Telephone Cable WD-36( )/TT. The cable is contained in two dispenser packages, one containing 1/4 mile of cable, designated Cable Dispenser MX-6895( )/TT and the other containing 1/2 mile of cable, designated Cable Dispenser MX-6894( )/TT. (See 6.1 and 6.6).

## 2. APPLICABLE DOCUMENTS

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

## SPECIFICATIONS

## FEDERAL

J-C-98	Cable and Wire, Insulated; Methods of Sampling and Testing
L-P-390	Plastic Molding Material, Polyethylene, Low and Medium Density
CCC-C-419	Cloth, Cotton Duck, Unbleached, Plied-Yarn (Army and Numbered)
CCC-D-950	Dying and After Heating Process for Cotton Cloths
PPP-B-636	Box, Fiberboard
PPP-F-320	Fiberboard: Sheet Stock (Container Grade) and Cut Shapes
PPP-T-76	Tape, Pressure-Sensitive Adhesive Paper, Water Resistant (For Carton Sealing)
PPP-T-97	Tape; Pressure-Sensitive Adhesive Filament Reinforced

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MIL-P-116	Preservation, Methods of
MIL-T-3530	Treatments, Mildew-Resistant and Water Repellent for Threads and Twine
MIL-F-8261	Fungus Resistance Tests, Aeronautical and Associated Materials, General Specification for
MIL-M-13231	Marking of Electronic Items
MIL-F-14072	Finishes for Ground Equipment

## STANDARDS

## MILITARY

MIL-STD-105	Sampling Procedures and Tables for Inspection by Attributes
MIL-STD-109	Inspection Terms and Definitions
MIL-STD-129	Marking for Shipment and Storage
MIL-STD-147	Palletized Unit Loads
MIL-STD-170	Moisture Resistance Test Cycle for Ground Signal Equipment
MIL-STD-417	Rubber Composition, Vulcanized, General Purpose, Solid (Symbols and Tests)

## DRAWINGS

## ELECTRONICS COMMAND

SC-DL-555912	Dispenser, Cable MX-6894( )/TT
SC-D-555913	Dispenser, Cable MX-6894/TT Assembly (1/2 mile)
SC-C-555914	Side Panel Assembly (1/2 mile)
SC-DL-555916	Dispenser, Cable MX-6895( )/TT
SC-D-555917	Dispenser, Cable MX-6895/TT Assembly (1/4 mile)
SC-C-555918	Side Panel Assembly (1/4 mile)

(Copies of specifications, standards, and drawings required by contractors in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer. Both the title and number or symbol should be stipulated when requesting copies.)

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

AMERICAN SOCIETY FOR TESTING MATERIALS

B211	Aluminum Alloy Bars, Rods, and Wire
D470	Methods of Testing Rubber and Thermoplastic Insulated Wire and Cable
D531	Indentation of Rubber by Means of the Pusey and Jones Plastometer
D573	Accelerated Aging of Vulcanized Rubber by the Oven Method
D746	Brittle Temperature of Plastics and Plastometers

(Applications for copies should be addressed to the American Society for Testing Materials at 260 South Street, Philadelphia 2, Pa.)

BELL TELEPHONE LABORATORIES

Procedure No. 200378 - Determination of Free Sulphur in Material and Synthetic Rubber Containing Sulphur Bearing Accelerators, dated 3 June 1943

(Applications for copies should be addressed to American Chemical Society 2 Park Avenue, New York, N.Y.)

3. REQUIREMENTS

3.1 Materials.-

3.1.1 Conductors.- The cable conductors shall be manufactured from the Aluminum Association Alloy 5052-O and shall meet the requirements of ASTM B211-63. Each conductor shall have a diameter of 0.022  $\pm$ 0.001 inch.

3.1.2 Insulating compound.- The material used for the cable conductor insulation shall be a polyethylene low density resin and shall meet the requirements of Specification L-P-390 for Type III, Grade 6A, Class 1.

3.1.3 Dispensers.- Dispenser, Cable MX-6894( )/TT (see Fig. 2) shall contain one half ( $\frac{1}{2}$ ) mile, and Dispenser, Cable MX-6895( )/TT one quarter ( $\frac{1}{4}$ ) mile of Cable, Telephone WD-36( )/TT. (See 1.1).

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3.1.3.1 Grommet.- The material used in grommets shall be of a high modulus, low brittle point synthetic rubber compound which has a good resistance to tear, abrasion, sunlight, ozone, humidity, heat and impact, plus good adhesion to canvas, in the temperature range of  $-67^{\circ}\text{F}$  to  $+145^{\circ}\text{F}$ ., in order to meet the service conditions of the grommet and equipment (see 6.5). The compound shall contain no natural rubber hydro carbon.

### 3.1.3.2 Fabric.-

3.1.3.2.1 Duck.- Duck fabric shall be in accordance with Specification CCC-C-419. After dyeing and treatment shall be as called for in 3.1.3.2.2 and 3.1.3.2.3.

3.1.3.2.2 Color.- The color of the fabric, immediately after tropicalization treatment in accordance with 3.1.3.2.3 shall be olive drab Nr. 7 (see 6.4).

3.1.3.2.3 Treatment of duck.- Duck shall be given type I class B after-treatment, water-repellent and mildew-resistant, conforming to Specification CCC-D-950.

## 3.2 Construction.-

3.2.1 Conductors.- Each cable conductor shall be composed of one strand of aluminum as specified in 3.1.1.

3.2.2 Insulation.- The pair shall be insulated with a tight, well centered o compound as specified in 3.1.2 with a wall thickness of  $0.007 \pm 001$  inch and a separation between conductors of  $0.017 \pm 003$  inch when measured as specified by Method 1018 of Specification J-C-98.

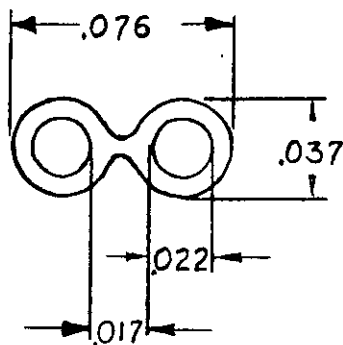
3.2.2.1 Configuration.- The pair shall consist of two conductors in parallel commonly insulated in an approximate figure eight cross section. (See figure 1.)

3.2.3 Dispenser.- Construction of the dispensers called for in 3.1.3 shall be in accordance with Drawing Lists SC-DL-555912 ( $\frac{1}{2}$  mile) and SC-DL-555916 ( $\frac{1}{4}$  mile). Construction shall be such that the completed dispenser will withstand the tests specified in section 4. The general configuration is illustrated in Figure 2.

3.2.3.1 Grommet.- The grommet required by Drawings SC-C-555914  $\frac{1}{2}$  mile and SC-C-555918  $\frac{1}{4}$  mile shall conform to these drawings and to this specification.

3.2.3.2 Cable coil.- Each Dispenser, Cable MX-6894( )/TT shall contain a minimum of 2640 feet, and a maximum of 2720 feet, and Dispenser, Cable MX-6895( )/TT shall contain a minimum of 1320 feet and a maximum of 1380 feet of Cable, Telephone WD-36( )/TT which shall comply with this specification before and after packaging in either dispenser. (See 1.1).

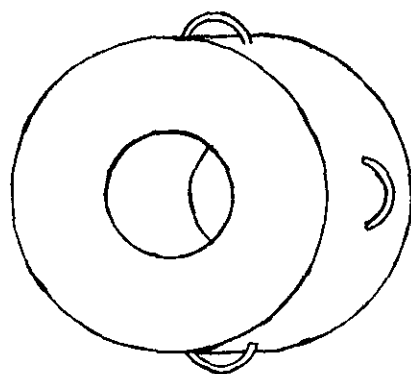
3.2.3.2.1 Winding of coil.- The cable coil shall be universally wound over a  $1\text{-}3/4$  inch diameter mandrel as specified in 3.2.3.2.1.1 through 3.2.3.2.1.4.



WD-36( )/TT

NO. 23 AWG SOLID ALUMINUM CONDUCTORS  
.007 INCH NOMINAL WALL OF LOW DENSITY POLYETHYLENE

FIG. 1



DISPENSER

FIG. 2

3.2.3.2.1.1 Positioning.- The canvas side panels shall be secured to two rigid supports which are positioned on the mandrel 2 1/16 inches apart for the 1/4 mile and 4 1/16 inches apart for the 1/2 mile dispenser. The side panels shall be oriented with respect to each other so that the tabs from each side will overlap in final assembly.

3.2.3.2.1.2 Guide and pitch control.- The wire shall be guided to the point of contact with the coil. The pitch shall be such that it will form a universal wind with three revolutions per single traverse on the 1/2 mile dispenser and one and one half revolutions per traverse on the 1/4 mile dispenser.

3.2.3.2.1.3 Outside diameter.- The maximum diameter of the coil after applying the final tape shall be 6 1/2 inches for the half mile dispenser and 6 1/8 inches for the one-quarter mile dispenser.

3.2.3.2.1.4 Cable ends.- The "standing" and "pay out" ends of the cable shall be prepared as indicated on Drawings SC-D-555913 and SC-D-555917.

3.2.3.3 Finishing operations.- When the required footage of cable has been wound into the coil, the length of cable necessary to comply with 3.2.3.2.1.4 shall be pulled through to the center of the coil. The following sequence of operations, shown on Drawings SC-D-555913 and SC-D-555917 shall complete the packaging of Dispenser, Cable MX-6894( )/TT and MX-6895( )/TT:

- (a) Apply one layer of the double coated tape with 50 percent overlap.
- (b) Turn tabs of one side wall across the outside of the coil and firmly attach to the layer of adhesive tape. Note: To assemble the D-rings, bring tabs through three rings 90 degrees apart, locating the rings approximately in the center of the coil width.
- (c) Apply a second layer of double coated tape with 50 percent overlap. Do not cover the D-rings. This can be accomplished by slitting the tape to go around the ring.
- (d) Turn the tabs of the second side panel across the outside of the coil and attach firmly to the adhesive tape, passing the tabs opposite the D-rings through each ring.
- (e) Apply a single layer of the single coated olive drab tape with 50 percent overlap. Do not cover D-rings.
- (f) After all tests are completed, arrange the "pay out" and "standing" ends of the cable (which have each been secured in a small compact coil) inside the coil in the open center core.
- (g) Apply the closure material (the olive drab tape) over the 1 1/2 inch diameter opening in each side wall.

### 3.3 Performance requirements.-

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### 3.3.1 Cable.-

3.3.1.1 Tubing (heat shock).- The insulated pair shall show no visible strains or cracking of the insulation when tested as specified in 4.6.1.

3.3.1.2 Thermal stress cracking.- The insulated pair shall show no visible strains or cracking of the insulation when tested as specified in 4.6.2.

3.3.1.3 Cold bend.- The insulated pair shall not crack either before or after aging when tested as specified in 4.6.3 and 4.6.3.1.

3.3.1.4 Elongation.- Insulation elongation shall not be less than 400 percent when tested as specified in 4.6.4.

3.3.1.5 Elongation after aging.- Insulation elongation after aging when tested as specified in 4.6.5, shall not have less than 80 percent of elongation as measured in 4.6.4.

3.3.1.6 Breaking load.- The breaking load shall be not less than 25 pounds for the insulated pair. (See 4.6.6).

### 3.3.2 Dispenser.-

3.3.2.1 Grommet.- The manufacturer of the side panels shall furnish a certificate of compliance that the rubber compound used in making the grommets meets requirements 3.3.2.1.1 through 3.3.2.1.9.

3.3.2.1.1 Tensile strength.- The tensile strength, original, shall be not less than 1,900 pounds per square inch (p.s.i.).

3.3.2.1.2 Elongation.- The ultimate elongation, original, shall be not less than 300 percent.

3.3.2.1.3 Hardness.- The original plastometer indentation hardness when tested as specified in 4.12.3 shall be not greater than 1.05 millimeters.

3.3.2.1.4 Accelerated aging.- Specimens shall be aged in accordance with the tests as specified in 4.12.4 for compliance with 3.3.2.1.5 and 3.3.2.1.6.

3.3.2.1.5 Aged tensile strength.- The change in tensile strength after aging when tested as specified in 4.12.4.1 shall be not greater than 25 percent.

3.3.2.1.6 Aged elongation.- The change in ultimate elongation after aging when tested as specified in 4.12.4.2, shall be not greater than 35 percent.

3.3.2.1.7 Low temperature impact resistance.- When tested as specified in 4.12.5 there shall be no evidence of chipping or cracking.

3.3.2.1.8 Free sulphur.- Free elemental sulphur in the rubber test specimens and molded rubber grommets on the dispensers shall be not greater than 0.05 percent when tested in accordance with 4.12.6.



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3.3.2.1.9 Antideterioration.- The material shall show no cracks after exposure to an ozone concentration of 50 parts per hundred million of air after oven exposure for 70 hours at 158°F. (See 4.12.7).

3.3.2.2 Finished package.-

3.3.2.2.1 Continuity.- The wire contained in the dispensers, shall have no open conductors or shorts between conductors when tested per 4.14.

3.3.2.2.2 Dielectric strength and insulation resistance.- The cable in its dispenser shall withstand the test specified in 4.6.7 without breakdown. Following this test and when tested as specified in 4.8 the insulation resistance shall not be less than 500 megohms - 1000 feet.

3.3.2.2.3 DC resistance of wire in the dispenser.- When tested as specified in 4.7, the direct current resistance of the wire in the dispenser shall not exceed 125 ohms per 1,000 loop-feet.

3.3.2.2.4 Handling.- Dispensers shall withstand the handling test specified in 4.9.

3.3.2.2.5 Payout.- Dispensers shall withstand the payout test as specified in 4.10.

3.3.2.2.6 Spark test.- 100 percent of the cable shall be tested with a wet sponge spark tester as specified in 4.6.8. There shall be no more than one fault per quarter mile dispenser nor two per half mile dispenser.

3.4 Splices.- Splices or insulation repairs shall not be permitted in the finished cable.

3.5 Tape.- The single and double faced tape shall show no evidence of loosening or deterioration when tested as specified in 4.13. The single backed tape shall be given a tropicalization treatment of either the type specified in paragraph 3.1.3.2.3 or in accordance with Specification MIL-T-3530, class II treatment for thread. The double backed tape shall be treated with 1.50  $\pm$  .25 percent of total weight of finished tape of dihydroxydichlorodiphenyl methane or equal and shall show no deterioration when tested in accordance with Specification MIL-F-8261 for paper.

3.6 Temperature and humidity.- The dispensers when tested as specified in 4.11 shall show no evidence of loosening of the tape, rusting of the D-rings and shall meet the insulation resistance specified in 3.3.2.2.2.

3.7 Finish, protective.- The D-ring shall be given a protective finish in accordance with Specification MIL-F-14072.

3.8 Marking.- Marking shall conform to Specification MIL-M-13231. (See 4.4).

3.9 Preproduction samples.- The contractor shall furnish for approval, if required by the invitation for bids and contract (see 4.3 and 6.2 (e) (1)), ten each preproduction samples of Dispenser, Cable MX-6894( )/TT complete with  $\frac{1}{2}$  mile of Cable, Telephone WD-36( )/TT or Dispenser, Cable MX-6895( )/TT complete with  $\frac{1}{4}$  mile of Cable, Telephone WD-36( )/TT, whichever is called for. In the event that both sizes are called for, the

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contractor shall submit ten each of Dispenser, Cable MX-6894( )/TT and Dispenser, Cable MX-6895( )/TT, both types to be complete with cable. The samples are to be representative of the units which will be furnished in quantity production and shall be submitted for approval of the designated Government agency. A minimum of 7 sample test sheets, in accordance with Standard MIL-STD-417 and 4 sample plastometer test sheets in accordance with American Society for Testing Materials Specification D531 shall be submitted by the contractor prior to start of production. The samples furnished shall contain grommets of an equivalent cure representative of the rubber to be furnished in production.

3.10 Workmanship.— Workmanship for the cable and dispensers shall be such as to meet the requirements of paragraphs 3.1 through 3.9 of this specification and any referenced subsidiary specification or other document when inspected in accordance with 4.3 and 4.4.

#### 4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection.— Unless otherwise specified in the contract 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 commercial laboratory acceptable to 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 that supplies and services conform to prescribed requirements.

4.1.1 Test equipment and inspection facilities.— Test equipment and inspection facilities shall be of sufficient accuracy, quality, and quantity to permit performance of the required acceptance inspection. The manufacturer shall establish adequate calibration of test equipment to the satisfaction of the Government.

4.2 Classification of inspection.— Inspection shall be classified as follows:

(a) Preproduction inspection (does not include preparation for delivery).  
(See 4.3).

(b) Inspection covered by subsidiary documents. (See 4.4).

(c) Quality conformance inspection.

(1) Quality conformance inspection of equipment before preparation for delivery. (See 4.5).

(2) Quality conformance inspection of preparation for delivery.  
(See 4.16).

4.3 Preproduction inspection.— This inspection will be performed by the Government unless otherwise specified in the contract. It shall consist of the preproduction inspection specified in table I, the inspection specified in the subsidiary documents covering the items listed in 4.4, and the inspection specified for Group A, Group B and Group C (see tables II, III and IV.)

Table I - Preproduction inspection

Inspection (For Additional Preproduction Inspection See 4.3)	Req. Para.	Insp. Para.
Grommet	3.3.2.1	
Tensile strength	3.3.2.1.1	4.12.1
Elongation	3.3.2.1.2	4.12.2
Hardness	3.3.2.1.3	4.12.3
Accelerated aging	3.3.2.1.4	4.12.4
Aged tensile strength	3.3.2.1.5	4.12.4.1
Aged elongation	3.3.2.1.6	4.12.4.2
Low temperature impact resistance	3.3.2.1.7	4.12.5
Free sulphur	3.3.2.1.8	4.12.6
Tape	3.5	4.13
Antideterioration	3.3.2.1.9	4.12.7
Temperature and humidity	3.6	4.11

4.4 Inspection covered by subsidiary documents.- The following shall be inspected under the applicable subsidiary documents as part of the inspection of equipment before preparation for delivery:

<u>Item</u>	<u>Where required</u>
Conductors	3.1.1
Insulating compound	3.1.2
Duck	3.1.3.2.1
Treatment of duck	3.1.3.2.3
Insulation	3.2.2
Dispenser	3.2.3
Grommet	3.2.3.1
Cable ends	3.2.3.2.1.4
Finishing operations	3.2.3.3
Finish, protective	3.7
Marking	3.8

4.5 Quality conformance inspection of equipment before preparation for delivery.- The contractor shall perform the inspection specified in 4.4 and 4.5.2 through 4.5.5.2. 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. The Government will review and evaluate the contractor's inspection procedures and examine the contractor's inspection records. In addition the Government--at its discretion--may perform all or any part of the specified inspection, to verify the contractor's compliance with specified requirements. (See 6.7). Test equipment for Government verification inspection shall be made available by the contractor.

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4.5.1 The inspection terms used herein conform to MIL-STD-109.

4.5.2 Group A inspection.- This inspection, including sampling, shall conform to table II and the inspection procedures of Standard MIL-STD-105, using the general specification levels. Group A inspection shall be performed in any order which is satisfactory to the Government. (See 4.5.1).

Table II - Group A inspection

<u>Inspection</u>	<u>Req. Para.</u>	<u>Insp. Para.</u>	<u>AQL Major</u>	<u>AQL Minor</u>
Visual and dimensional	3.1 to 3.2.3.3 inclusive 3.4 and 3.10	4.15	1.0 % for the group	4.0 %
<u>Electrical</u>				
Dielectric strength and insulation resistance	3.3.2.2.2	4.6.7 and 4.8	1.0 %  for the group	
D-C resistance of cable in dispenser	3.3.2.2.3	4.7		
Spark Test	3.3.2.2.6	4.6.8		

4.5.3 Group B inspection.- This inspection, including sampling, shall conform to table III and to the special procedures for small-sample inspection of Standard MIL-STD-105. The reduced inspection procedure shall be S-1. 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. (See 4.5.1).

4.5.3.1 Group B sampling plans.- The group B sampling plans, for the AQL's listed in table III, shall be as follows:

<u>AQL</u>	<u>Inspection level for normal and tightened inspection</u>	<u>Inspection level for reduced inspection</u>
4.0%	S-4	S-3
6.5%	S-4	S-3
10.0%	S-3	S-2
15.0% dphu	S-3	S-2

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4.5.3.2 Order of inspection within group B.- Group B inspection shall be performed in any order which is satisfactory to the Government.

Table III - Group B inspection

Inspection	Req. Para.	Insp. Para.
Tubing (heat shock)	3.3.1.1	4.6.1
Thermal stress cracking	3.3.1.2	4.6.2
Cold bend (before aging)	3.3.1.3	4.6.3
Elongation	3.3.1.4	4.6.4
Breaking load	3.3.1.6	4.6.6
Handling	3.3.2.2.4	4.9
Payout	3.3.2.2.5	4.10
Continuity and shorts	3.3.2.2.1	4.14

4.5.4 Reinspection of conforming group B sample units.- Unless otherwise specified, sample units which have been subjected to and passed group B inspection may be accepted on contract, provided that they are resubjected to and pass group A inspection after repair of all visible damage.

4.5.5 Group C inspection.- This inspection shall be as listed in table IV, and shall normally be performed on sample units that have been subjected to group A and group B inspection. (See 4.5.1).

Table IV - Group C inspection

Inspection	Req. Para.	Insp. Para.
Cold bend (after aging)	3.3.1.3	4.6.3.1
Elongation after aging	3.3.1.5	4.6.5

4.5.5.1 Sampling procedure.- One sample unit shall be selected from each 100 miles of finished cable and two specimens shall be cut from each sample unit to perform to group C inspection.

4.5.5.2 Noncompliance.- If a sample unit fails group C inspection, the contractor shall immediately investigate the cause of failure and shall report to the Government inspector the results thereof and details of the corrective action taken on the process and all units of product which were manufactured with the same conditions, materials, processes, etc. If the Government inspector does not consider that the corrective action will enable the product to meet specified requirements, or if the contractor cannot determine the cause of failure, the matter shall be referred to the contracting officer. (See 6.3).

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#### 4.6 Cable tests.-

4.6.1 Tubing (heat shock).- The specimen (insulated pair) shall be looped back and wound tightly on itself for five close turns. The ends shall be securely taped, and the specimen shall be placed in an air oven maintained at a temperature of  $121^{\circ} \pm 1^{\circ}\text{C}$  for 24 hours, plus 5 or minus 0 minutes. The specimen shall then be removed from the oven and the insulation examined for strains or cracks under a magnification of at least three diameters (focal distance of 8 centimeters.) (See 3.3.1.1).

4.6.2 Thermal stress cracking.- The test of 4.6.1 shall be performed except that the specimen shall be placed in an air oven for 14 days at  $100^{\circ} \pm 1^{\circ}\text{C}$ . (See 3.3.1.2).

4.6.3 Cold bend.- The specimen of insulated pair and a mandrel of  $0.040 \pm 0.002$  inch diameter shall be placed in a cold chamber maintained at a temperature of  $-65^{\circ}\text{F} \pm 2^{\circ}\text{F}$  for a period of 24 hours. At the end of this time, while still in the cold chamber, the specimen shall be wound around the mandrel for 5 close turns at a rate of approximately one turn per second. During this processing, no object having a temperature higher than  $-65^{\circ} \pm 2^{\circ}\text{F}$  shall come within twelve inches of the point of the specimen being wound. After the test, the specimen shall be examined under a magnification glass with at least three diameters magnification for visible evidence of cracking of the insulation. (See 3.3.1.3).

4.6.3.1 Cold bend after aging.- A specimen of insulated pair shall be placed in an air oven conforming to the requirements of Paragraph 4 of ASTM D-573 and maintained at a temperature of  $100^{\circ}\text{C} \pm 1^{\circ}\text{C}$  for a period of 7 days. After a cooling period of at least 24 hours at room temperature, the specimen shall be tested as specified in 4.6.3, except the temperature shall be  $-40^{\circ}\text{C} \pm 1^{\circ}\text{C}$ . (See 3.3.1.3).

4.6.4 Elongation.- A specimen of a full cross-section of conductor pair insulation shall be tested in accordance with ASTM D-470 at a speed of two inches per minute. (See 3.3.1.4).

4.6.5 Elongation after aging.- A specimen of a full cross-section of conductor pair insulation shall be placed in an air oven conforming to the requirements of Paragraph 4 of ASTM D-573 and maintained at a temperature of  $100^{\circ}\text{C} \pm 1^{\circ}\text{C}$  for a period of 7 days. After a cooling period of at least 24 hours at room temperature, the specimen shall be tested as specified in 4.6.4. (See 3.3.1.5).

4.6.6 Breaking load.- The breaking load of an insulated pair shall be determined using the apparatus and method described in method 3212 of Specification J-C-98. (See 3.3.1.6).

4.6.7 Dielectric strength.- The cable shall be tested in its dispenser with a potential of 500 volts root-mean-square, 60 cycles, or a potential of 1000 volts dc applied for one minute. (See 3.3.2.2.2).

4.6.8 Spark test.- During spooling into dispenser, the cable shall be passed through a wet sponge spark tester having an electrode with a minimum length of 4 inches and a dc potential of 1500 volts applied between the electrode of the tester and the



two cable conductors. A fault relay having a sensitivity of 2.5 milliamperes and a fault counter, Durant type 4-Y-9434-PB or equal, shall be connected to the electrode to register the number of pin holes or blows in the cable insulation. The average cable speed through the electrode shall not be greater than 480 feet per minute. 100 percent of the cable shall be spark tested. The cable shall satisfy the requirement of 3.3.2.2.6.

4.7 DC resistance test.- The cable in the dispenser shall be tested for dc resistance at or corrected to 20°C and shall meet the requirements of 3.3.2.2.3.

4.8 Insulation resistance test.- The cable shall be tested in its dispenser using a potential of not less than 100 volts dc for 1 minute between conductors. The insulation resistance shall meet the requirements of 3.3.2.2.2.

4.8.1 When a 100 percent test of an entire lot is required, it is permissible to terminate the insulation resistance test in less than 1 minute if the galvanometer has ceased to fluctuate, and the reading indicates the minimum insulation resistance has been obtained. However, test results on 5 percent of the lengths after 1 minute electrification shall be recorded to permit a continuous check on quality.

4.9 Handling.- The sample dispensers shall be tested in the following manner: The dispenser containing cable shall be dropped 2 times from a height of 10 feet onto concrete surface so that the dispenser strikes on the 2 inch wide or 4 inch wide circumferential surface. The dispenser shall be rotated 90 degrees between the first and second impact to avoid striking twice in the same place. The dispenser may be distorted or the canvas side walls may split or pull out slightly from under the tape and not be cause for rejection but any damage of this nature shall require a payout test of the dispenser. This payout shall meet the test specified in 4.10. If the rubber grommet is pulled apart, the dispenser shall be rejected. The cover over the center hole shall be in place when the test is conducted; however, if it is torn or loosened by the first impact, it shall not be replaced for the second impact. (See 3.3.2.2.4).

4.10 Payout.- The sample dispensers shall be tested in the following manner: The cable in the dispenser shall be completely payed out at an average speed of 25 miles per hour. With the starting end of the cable anchored, a vehicle used as a means of transportation of the dispenser, shall attain a speed of 25 to 27 miles per hour within 500 feet from start and maintain the speed within this range for the distance required to pay out all the cable in the dispenser. The payout of the cable shall be considered satisfactory provided any single entanglement does not contain more than 50 feet of cable and the total footage in a series of entanglements does not exceed 100 feet of cable. An entanglement is the simultaneous removal of a number of feet of cable from the dispenser in a snarled mass. To determine the number of feet of cable involved in an entanglement, select and mark two points of the cable, one on each side of the entanglement and separated by a known number of feet. Untangle the cable and when straightened, measure the number of feet between the markers. The difference between the two measurements represents the number of feet of cable involved in the entanglement. Removal of the last layers of cable in the dispenser shall not cause collapse of the canvas container or pull out particles of the binding tape. Collapse of the container or removal by the cable of pieces of tape shall not be cause for rejection but the tension with which the tape is applied will be checked to insure

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that it is the minimum required to cause bonding of the overlap of the tape. Breakage of the cable during payout shall be considered unsatisfactory payout. After payout, the cable shall be tested for open conductors or shorts between conductors in the manner specified in 4.14. An open or shorted conductor shall be considered a failure of the payout test. Any contractor may offer for approval of the contracting officer a machine or method which will remove the cable from the dispenser in a manner equivalent to payout from a vehicle and if approved, substitute the machine or method for road payout. (See 3.3.2.2.5).

4.11 Temperature and humidity.- The sample dispensers shall be subjected to 5 continuous 48-hour cycles as shown in MIL-STD-170. During this period, the dispenser shall be tested for insulation resistance using a d.c. source of potential of not less than 100 volts applied for not less than 1 minute during periods indicated on the drawing. The measurement shall be made between conductors (one end open) and without removal of the dispenser from the test chamber for measurement. After removal from the test chamber, the dispenser shall be examined for loosening of the tape or rusting of the D-ring, either condition or failure to comply with the insulation resistance requirement of 3.3.2.2.2 shall be cause for rejection. Satisfactory dispensers shall then be inspected in accordance with 4.9 and 4.10. (See 3.6).

4.12 Grommet material.- The samples submitted in accordance with 3.1 shall have grommets made from material that has been tested in accordance with 4.12.1 through 4.12.6 and that meet requirements of 3.1.3.1. The manufacturer shall submit a certificate of compliance for the above.

4.12.1 Tensile strength.- The specimens shall be tested for tensile strength as described in Standard MIL-STD-417 and shall meet the requirements of 3.3.2.1.1.

4.12.2 Elongation.- The specimens shall be tested for elongation as described in Standard MIL-STD-417 and shall meet the requirements of 3.3.2.1.2.

4.12.3 Hardness.- The specimens shall be tested for original plastometer indentation hardness as described in American Society for Testing Material Specification D531 and shall meet the requirements of 3.3.2.1.3.

4.12.4 Accelerated aging.- Specimens shall be aged as described in American Society for Testing Materials Specification D-573, using a circulating air oven, for a period of 70 hours  $\pm 1/2$  hour at a temperature specified in 4.12.4.1 and 4.12.4.2. The specimens shall meet the requirements of 3.3.2.1.5 and 3.3.2.1.6.

4.12.4.1 Aged tensile strength.- The specimens shall be aged for 70 hours at a temperature of 212°F and the change in tensile strength shall not exceed the requirements of 3.3.2.1.5.

4.12.4.2 Aged elongation.- The specimens shall be aged for 70 hours at a temperature of 212°F and the change in ultimate elongation shall not exceed the requirements of 3.3.2.1.6.

4.12.5 Low temperature impact resistance.- The specimens shall be tested using apparatus for testing resistance to impact at low temperature as described in American Society for Testing Materials Specification D-746, using at least 3 specimens as received and 3 specimens previously aged at 221°F for 70 hours, placed in a cold chamber and conditioned at -80  $\pm 5$ °F for 14 days. The specimens shall meet the requirements of 3.3.2.1.7.



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4.12.6 Free sulphur.- Specimens shall be tested for free elemental sulphur in accordance with Bell Telephone Laboratories Procedure Nr. 20C378. Determination of Free Sulphur in Natural and Synthetic Rubber Containing Sulphur Bearing Accelerators. The specimens shall meet the requirements of 3.3.2.1.8.

4.12.7 Antideterioration.-

4.12.7.1 Ozone test.- The materials shall meet the requirements of Suffix C<sub>2</sub> of Standard MIL-STD-417.

4.12.7.2 If the canvas used with the rubber grommet has been treated or dyed with a copper-, iron-, or manganese-bearing material; the grommet compound shall contain 1.0 part per hundred of basic resin of a copper inhibitor.

4.13 Tape.- Samples of single backed and double backed tape in an overlap condition equivalent to that in a finished dispenser (or a finished dispenser containing cable) shall be immersed in either tap or salt water for 72 hours. Visual examination shall show no evidence of loosening of the adhesive bond. Samples of single backed tape shall be tested for tropicalization treatment in accordance with 3.1.3.2.3 or in accordance with Specification MIL-T-3530 for thread. Samples shall meet the requirements of 3.5. Samples of double backed tape shall be tested in accordance with the requirements of Specification MIL-F-8261 for paper.

4.14 Opens and shorts.- The cable in each dispenser shall be tested for open conductors or shorts between conductors using a voltohmmeter or other suitable low potential testing device. The test for shorts will be made with one end of the wires open and for continuity with this same end shorted. The samples shall meet the requirements of 3.3.2.2.1.

4.15 Visual and dimensional.- The cable and dispensers shall be given a thorough inspection for conformance to 3.1 to 3.2.3.3 inclusive, 3.4 and 3.10.

4.16 Quality conformance inspection of preparation for delivery.- Preparation for delivery shall be inspected in accordance with Specification MIL-P-116 to determine conformance with requirements of section 5.

5. PREPARATION FOR DELIVERY

5.1 Preservation and packaging.- Preservation and packaging shall be Level A or C as specified. (See 6.2).

5.1.1 Level A.-

5.1.1.1 Cleaning.- Cable, Telephone WD-36( )/TT on Dispenser, Cable MX-6895( )/TT or MX-6894( )/TT shall be cleaned in accordance with process C-1 of MIL-P-116.

5.1.1.2 Drying.- Cable, Telephone WD-36( )/TT on Dispenser, Cable MX-6895( )/TT or MX-6894( )/TT shall be dried in accordance with MIL-P-116.

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5.1.1.3 Unit packaging.- Cable, Telephone WD-36( )/TT on Dispenser, Cable MX-6895( )/TT or MX-6894( )/TT shall be packaged in accordance with Method III of MIL-P-116 as follows: Each Dispenser with Cable shall be cushioned on all surfaces with cells or pads or both, fabricated of fiberboard conforming to PPP-F-320, type CF, class domestic, variety SW, grade 200. The cushioning shall be designed to support interior surfaces of the unit container. Place the cushioned Dispenser within a close-fitting fiberboard box conforming to PPP-B-636, type CF, class domestic, variety SW, grade 200. Close box in accordance with the appendix to the box specification.

5.1.1.4 Consolidated package.- A quantity of Dispensers, MX-6895( )/TT or MX-6894( )/TT, packaged as specified in 5.1.1.3, shall be placed within a close-fitting fiberboard box conforming to PPP-B-636, grade W5c for special requirements use. Close box in accordance with the appendix to the box specification. In addition, seal all seams and joints with pressure-sensitive tape conforming to PPP-T-76. The box shall be reinforced in accordance with the appendix to the box specification, using tape conforming to PPP-T-97, type IV.

5.1.2 Level C.- Cable, Telephone WD-36( )/TT on Dispenser, Cable MX-6895( )/TT or MX-6894( )/TT. Each Dispenser with Cable shall be preserved and packaged in a manner that will afford adequate protection against corrosion, deterioration and damage during shipment from the supply source to the first receiving activity.

5.2 Packing.- Packing shall be Level A, B, or C as specified. (See 6.2).

5.2.1 Level A.- A quantity of Dispensers, MX-6895( )/TT or MX-6894( )/TT, packaged as specified in 5.1.1.4, shall be packed on a pallet, load Type 1, conforming to MIL-STD-147. A fiberboard cap shall be employed over the load having two sides extending down the stacked load at least 12 inches to accommodate marking requirements. The cap shall be fabricated of fiberboard conforming to PPP-F-320, type SF, class weather-resistant, grade W5s. The load shall be bonded to the pallet by strapping. When quantities to one destination are less than a pallet-load, Dispensers, MX-6895( )/TT or MX-6894( )/TT, packaged as specified in 5.1.1.4, shall require no further packing.

5.2.2 Level B.- A quantity of Dispensers, MX-6895( )/TT or MX-6894( )/TT, shall be packed as specified in 5.2.1 except that fiberboard caps conforming to PPP-F-320 shall be class domestic.

5.2.3 Level C.- A quantity of Dispensers, MX-6895( )/TT or MX-6894( )/TT, shall be packed as specified in 5.2.1 except that pallets and fiberboard caps shall be of the type, size and kind commonly used for the purpose and shall comply with the rules and regulations of the common carrier as applicable to the mode of transportation. Packing shall be accomplished in a manner that will afford adequate protection to the package and its contents during shipment from the supply source to the first receiving activity.

5.3 Marking.- In addition to any special marking required by the contract or order, interior packages and exterior shipping containers shall be marked in accordance with MIL-STD-129.

## 6. NOTES

6.1 Intended use.- Ultralightweight Assault Cable (Cable, Telephone WD-36( )/TT) is suitable for Army use in short line circuits at brigade and other headquarters of similar or smaller size for wiring of command posts, weapon positions, outposts, and short patrols. Portions of the basic load of WD-1/TT at brigade and lower level can be replaced by WD-36( )/TT.

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

(a) Title, number, and date of this specification and any amendment thereto.

(b) Type required.

(c) Level of packaging and level of packing required for shipment. (Level A, level B, or level C.) (See section 5).

(d) The specific paragraphs of section 5 which are applicable to the particular procurement:

(e) Preproduction inspection:

(1) Ten sample units of each item cited in section 1 are generally required so that lengthy environmental tests can be completed on one sample unit while complete performance measurements can be made on the second sample unit. (See 3.9).

(2) Preproduction pack(s) as follows:

Makeup of pack(s).  
Number of each kind of pack to be submitted.  
Inspection to be performed thereon.

(f) Marking and shipping of samples.

(g) Place of final inspection.

6.3 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 corrective action. (See 4.5.5.2).

6.4 Color.- A sample swatch of fabric, colored Olive Drab Nr. 7, may be obtained from the Quartermaster Depot, Specification Control Branch, Philadelphia 45, Pa. (See 3.1.3.2.2).

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6.5 Grommet.- The following RUBBER RECEIPE (in parts by weight) is given as a guide: (See 3.1.3.1).

GR-S-1505	100.
Sulphur (maximum)	1.0
HAF Black	70.0
Indonex 637 1/2	10.0
Sunproofing wax	3.0
Flexamine	1.0
Tonox	1.0
Agerite Resin D	1.0
Peptizer, Activators, vulcanizants as needed	

6.6 Nomenclature.- The parenthesis in the nomenclature will be deleted or replaced by a letter identifying the particular design; for example WD-36W/TT. The contractor should apply for nomenclature in accordance with the applicable clause in the contract. (See 1.1).

6.7 Verification inspection.- Verification by the Government will be limited to the amount deemed necessary to determine compliance with the contract and will be limited in severity to the definitive quality assurance provisions established in this specification and the contract. The amount of verification inspection by the Government will be adjusted to make maximum utilization of the contractor's quality control system and the quality history of the product.

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