

MIL-S-55586(EL)  
20 November 1967

## MILITARY SPECIFICATION

### SHELTER, ELECTRICAL EQUIPMENT S-302()/TCC-62

#### 1. SCOPE

1.1 Scope: This specification covers the air or vehicular transportable shelter facility part of the Terminal, Telephone, AN/TCC-62() which is capable of providing secure multiplex terminal facilities of two groups of 48 channels for cable transmission or, with other assemblages for radio transmission. (See 6.1 and 6.5)

#### 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 document to the extent specified herein:

#### SPECIFICATIONS

##### FEDERAL

V-T-276	Thread, Cotton
V-T-295	Thread, Nylon
QQ-A-200	Aluminum Alloy Bar, Rod, Shapes and Tube, Extruded, General Specification
QQ-A-225	Aluminum Alloy Bar, Rod, Wire or Special Shapes, Rolled Drawn or Cold Finish, General Specification for
QQ-A-250	Aluminum Alloy Plate and Sheet; General Specification for
QQ-S-571	Solder, Tin Alloy and Lead Alloy
QQ-S-698	Steel, Sheet and Strip, Low Carbon
QQ-S-766	Steel, Plate, Sheet and Strip - Corrosion Resisting
TT-E-516	Enamel, Lusterless, Quick-Drying, Styre- ated Alkyd Type
TT-E-527	Enamel, Alkyd, Lusterless
TT-E-529	Enamel, Alkyd, Semi-Gloss

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MIL-P-116	Preservation, Methods of
MIL-W-530	Webbing, Textile, Cotton, General Purpose, Natural or In Colors
MIL-T-3530	Thread and Twine, Mildew Resistant or Water Repellent Treated
MIL-C-3885	Cable Assemblies and Cord Assemblies (for use in Electronic and Associated Electrical Equipment)
MIL-W-4088	Webbing, Textile, Woven Nylon
MIL-W-6858	Welding, Resistance, Aluminum, Magnesium, Non-Hardening Steels or Alloys, Nickel Alloys, Heat-Resisting Alloys and Titanium, Spot and Seam
MIL-T-7928	Terminals, Lug and Splice, Crimp Style Copper
MIL-M-13231	Marking of Electronic Items
MIL-F-14072	Finishes for Ground Signal Equipment
MIL-F-14256	Flux, Soldering, Liquid (Rosin Base)
MIL-E-15090	Enamel, Equipment, Light-Grey formula No. 111
MIL-W-27265	Webbing, Textile, Woven Nylon, Impregnated
MIL-E-46061	Enamel, Camouflage, Solar and Heat-Reflecting
MIL-C-55169	Connector, Electric, Type Q, Multi-Contact
MIL-E-55301	Electromagnetic Compatibility
MIL-S-55505	Shelter, Electrical Equipment (Containing Equipment) Packaging and Packing of

## STANDARDS

## FEDERAL

FED-STD-595	Colors
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## MILITARY

MIL-STD-105	Sampling Procedures and Tables for Inspection by Attributes
MIL-STD-202	Test Methods for Electronic and Electrical Component Parts

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MIL-STD-252	Wired Equipment, Classification of Visual and Mechanical Defects
MIL-STD-1235	Single and Multilevel continuous sampling procedures & tables for inspection by attributes.
DRAWINGS	
ELECTRONIC COMMAND	
SC-C-532288	Schematic Diagram, Voltage Outout Protector
DL-SC-A-595479	Supplemental Data List for S-302()/TCC-62

(Copies of specifications, standards, drawings, and publications required by suppliers 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 shall be stipulated when requesting copies.)

### 3. REQUIREMENTS

3.1 Description.- Shelter, Electrical Equipment S-302()/TCC-62 hereinafter called the shelter facility, includes a modified S-280()/G shelter and all racks, brackets, shelves, tie-downs, electrical components and wiring to enable installation and operation of the assemblage components of the AN/TCC-62(). (See 6.1 and 6.2)

3.2 Preproduction sample.- Unless otherwise specified in the invitation for bids and contract, the contractor shall furnish one preproduction sample of the shelter facility for approval. (See 4.3)

### 3.3 Construction.-

3.3.1 Procurement model.- A procurement model of the S-302()/TCC-62 will be available for inspection by prospective bidders and will be lent to the contractor. Unless otherwise specified herein or in the invitation for bids, physical construction of the equipment shall conform to the model.

3.3.2 Drawings.- Parts and assemblies for use in the S-302()/TCC-62 facility shall be constructed in accordance with drawings listed on DL-SC-A-595479.

### 3.3.3 Materials.-

3.3.3.1 Fabric and thread.- Fabric and thread shall conform to the following:

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a. The color of fabric shall be Olive-Drab No.7. The color of thread shall match shade S-1 of the United States Army Standard Color Card for Official Standardization Shades of Sewing Thread. Fabric and thread shall be preshrunk, or allowance shall be made for shrinkage, in order to provide for satisfactory fit of finished items both before and after they are immersed in water and then dried.

b. Thread shall be cotton per V-T-276 and be given mildew resistant treatment in accordance with MIL-T-3530, Class II, and nylon per V-T-295.

c. Webbing shall be cotton in accordance with MIL-W-530, Class 7; and nylon per MIL-W-4088 or Class R of MIL-W-27265.

3.3.3.2 Metals.- Metals shall be selected from the appropriate detailed specifications of the basic specification cited in 2.1 as follows:

a. Extruded aluminum shall be in accordance with QQ-A-200.

b. Structural aluminum shall be in accordance with QQ-A-225.

c. Sheet aluminum shall be in accordance with QQ-A-250.

d. Sheet and strip steel shall be in accordance with QQ-S-698.

e. Sheet, strip, and plate steel, corrosion resistant shall be in accordance with QQ-S-766.

### 3.4 Electrical installation.-

3.4.1 Power system wiring and components.- Installation of power wires and components (including cable assemblies, receptacles, meters, circuit breakers, neon lamps, fluorescent lamps, incandescent lamps, lighting fixtures, distribution assembly and wiring components constituting a three wire electrical power distribution system) shall be installed and wired in accordance with the model. The completed in-place power distribution system shall meet the following requirements.

3.4.1.1 Continuity of conductors.- Electrical continuity shall exist between each of the pins numbered 1,2, and 4 (of power connector IN in power entrance box) and its respective circuit terminations (at receptacles, switches, lighting fixtures and lamp holders) and also between each of the pins numbered 1,2, and 4 (of power connector IN and its respective termination (at pins numbered 1,2, and 4 of power connector OUT when tested in accordance with 4.6.1 and 4.6.1.1.

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NOTE: Tests to satisfy the requirements of 3.4.1.1 (See 4.6.1 and 4.6.1.1) shall be accomplished following completion of power system wiring and prior to mounting of AC power receptacles in the wireway.

3.4.1.2 Dielectric strength of insulation.- The insulation of all wires, cables, and components shall withstand a potential of 600 volts DC continuously applied for not less than 30 seconds when tested in accordance with 4.6.1 and 4.6.1.2.

3.4.1.3 Insulation resistance.- The resistance of insulation between any two of the three circuit conductors and also between each of the three circuit conductors and shelter ground shall not be less than 100 megohms when tested in accordance with 4.6.1 and 4.6.1.3.

3.4.2 Overvoltage control.- The overvoltage control shall be fabricated and wired in accordance with the drawings and shall meet the following requirements.

3.4.2.1 Dielectric strength of insulation.- As required in 3.4.1.2 when tested in accordance with 4.6.2.1.

3.4.2.2 Insulation resistance.- As required in 3.4.1.3 when tested in accordance with 4.6.2.2.

3.4.2.3 Voltage drop.- A voltage drop of less than 250 mv shall exist between each pin of connector P3 and its respective pin of connector P4 when the circuit current is 50 amperes (See 4.6.2.3.)

3.4.3 Power distribution and operational functions.- Main power branch distribution and circuit switching functions thereof shall meet the operational requirements as denoted by the model when tested in accordance with 4.6.3.

3.4.4 Signal (audio) system wiring and components.- Installation of signal (audio) wires, cables and wiring components (including binding posts, connectors, plugs, jacks, receptacles, switches, terminal strips, terminal blocks, and wiring devices) shall be installed and connected in accordance with the model. The completed in-place signal (audio) system installation shall meet the following requirements:

3.4.4.1 Continuity and circuit resistance.- There shall be circuit continuity between the following wire terminations (resistance of these continuous circuits shall not exceed 5 ohms) when tested in accordance with 4.6.4.1):

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a. Pins 1A thru 24B of each audio connector (1 thru 8) and the corresponding pins of audio connectors P1 thru P3 when the respective CABLE/BINDING POST channel switch is placed in the CABLE position.

b. Binding posts 1A thru 24B of each system (1 thru 8) and the corresponding pins of audio connectors P1 thru P3 when the respective CABLE/BINDING POST channel switch is placed in the BINDING POST position.

c. Each phone jack terminal and each of the following: corresponding binding posts in the signal entrance box, corresponding pins of audio connectors (1 thru 8), and the corresponding binding posts in the power entrance box.

d. Each intercom jack terminal and each of the following: corresponding binding posts in the signal entrance box, corresponding pins of audio connectors (1 thru 8) and the corresponding binding posts in the power entrance box.

3.4.4.2 Dielectric strength of insulation.- The insulation of all wires, cables, and components shall withstand a potential of 600 volts DC continuously applied for not less than 5 seconds when tested in accordance with 4.6.4.2.

3.4.4.3 Insulation resistance.- The resistance between each of the following shall not be less than 100 megohms when tested in accordance with 4.6.4.3:

- a. Each wire conductor and other remaining wire conductors.
- b. Each component conductor and all other remaining component conductors.
- c. Each wire conductor and shelter ground.
- d. Each component conductor and shelter ground.
- e. Each wire conductor and connector shields.

3.4.5 Video system wiring and components.- Installation of video cables and connecting components (including plugs, connectors, adaptors, fittings, receptacles, and lightning protectors) shall meet the following requirements:

3.4.5.1 Continuity and Circuit resistance.- There shall be circuit continuity between the following video cable terminations (resistance of the continuous circuit shall not exceed 3 ohms when tested in accordance with 4.6.5.1):

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- a. Both end terminations of the inner conductor.
- b. Both end terminations of outer conductor (shield).
- c. Each end of the outer conductor and facility ground terminal.

3.4.5.2 Dielectric strength of insulation.- The insulation of all video cables, components, and lightning protectors shall withstand the following potentials when tested in accordance with 4.6.5.2:

- a. 1700 volts DC (applied continuously for not less than 30 seconds) to all video cables with lightning protector elements removed.
- b. 1200 volts DC (applied continuously for not less than 30 seconds) to all video cables with lightning protector elements in place.

3.4.5.3 Insulation resistance.- The resistance between each inner conductor and outer conductor (shield) and between each inner conductor and shelter ground shall not be less than 100 megohms when tested in accordance with 4.6.5.3.

3.4.6 Cable assemblies.- Cables and phone cords shall be fabricated in accordance with the drawings and meet the requirements and tests of MIL-C-3885. (See 4.4)

3.4.7 Suppression of radio frequency interference.- The motors in the ventilating equipment and the heaters used in the facility, if other than those specified on the drawings, shall meet the emanation limits of MIL-E-55301 for tactical equipment. (See 4.4)

3.5 System operation.- With all operational equipments of the AN/TCC-62() assemblage installed, and the roadside and curbside TD-204 multiplexers connected back-to-back, communications shall be established between telephones connected to corresponding terminations in the roadside and curbside signal entrance boxes (See 4.7).

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3.6 Vehicular transportation.-- The shelter facility shall be capable of being transported over cross-country terrain by military vehicles without sustaining any permanent damage. (See 4.8)

3.7 Railroad transportation.-- The shelter facility shall be capable of being loaded, blocked, and braced on a flatcar for shipment by rail. When so loaded, the shelter facility shall be subjected to and withstand the test of paragraph 4.9 without sustaining any buckling, delamination, or other permanent deformation.

3.8 Drops, flat and rotational.-- The shelter facility shall be capable of withstanding drops of 18 inches onto concrete. After all drop tests of 4.10.1 and 4.10.2 there shall be no buckling or delamination or other permanent deformation.

3.9 Watertightness.-- The shelter facility shall be capable of withstanding the test of 4.11. After the test there shall have been no leakage into the facility.

3.10 Fording.-- The shelter facility shall be capable of being immersed in water to a depth of 21 inches, measured from the bottom of the skids, for 1 hour without any leakage of water into the facility. (See 4.12)

3.11 Mounting inserts.-- All mounting inserts shall be installed without the use of any auxiliary materials such as adhesive and when installed each insert shall be capable of withstanding the tensile load and the torque load referenced in 4.13. There shall be no damage to the insert threads, the insert shall not have rotated from its original position, and there shall be no permanent distortion of the shelter mounting surface or insert head or threads. Insert threads and outer face of insert head shall be free of paint.

3.12 Cleaning.-- After fabrication, parts shall be cleaned in accordance with good commercial practice or as specified in the applicable portions of Specification MIL-F-14072. Cleaning processes shall have no deleterious effect. Corrosive material shall be removed completely before the parts are assembled. After assembly, units shall be cleaned thoroughly and shall be free from particles of solder, flux, scale, and any other foreign material. In addition, when necessary, such cleaning shall also be performed before and after final assembly of the units.

3.13 Finish.-- The shelter facility shall be finished in accordance with the following:



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3.13.1 Exterior surfaces.-- The exterior surfaces of the S-368()/MGC-9A such as for covers of boxes, side flaps on covers for blower exhaust, will have the same finish as the exterior surfaces of the bare shelter (finish P515 per MIL-E-14072; then lusterless white enamel No 37875 per FED Spec TT-E-516, 0.75 to 1.0 mil dry film thickness; then final film of lusterless green enamel per MIL-E-46061 dry film thickness 1.5 to 2.0 mils).

3.13.2 Exterior hardware.-- Exterior hardware of the S-368()/MGC-9A such as for entrance boxes, latches, braces, underside of covers, etc., will be finished the same as exterior surfaces except less the white enamel undercoat. These components will be painted prior to assembly to the shelter and any touch up will be with the lusterless green enamel of the shelter.

3.13.3 Interior.-- Finish per MIL-F-14072, P513. Follow with an application as below.

a. Ceiling, semi-gloss white enamel per Spec TT-E-529, color chip #27875 of Federal Standard No. 595.

b. Floor, lusterless gray enamel per Spec TT-E-527, color chip #36118 of Federal Standard No. 595.

c. Door and door brace, as in 3.13.1 above, to match exterior.

d. Walls, semi-gloss light green enamel per TT-E-529, color chip #24533 of Federal Standard No. 595.

e. Bracketry, semi-gloss light gray enamel per MIL-E-15090, Class 2. If bracketry is ferrous material and is not aluminum, finish per P213 of MIL-F-14072 instead of P513.

### 3.14 Marking.--

3.14.1 General.-- Marking shall conform to Specification MIL-M-13231 and the model.

3.14.2 Nameplates.-- Facility shall be provided with a nameplate. Each nameplate shall be imprinted with a sequential serial number.

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3.14.3 Aircraft loading data plate.- The facility shall be provided with a data plate in accordance with the model. The plate shall be imprinted with the dimensions which locate center-of-gravity in the three planes and the assemblage gross weight.

3.14.4 Interior and exterior marking.- All interior and exterior marking of the equipment shall be as depicted on the model.

3.15 Riveting.- Riveted joints shall be tight, the joined parts shall be undamaged, and the rivet heads shall be properly seated and tight against their bearing surfaces.

3.16 Seal, vapor.- All joints and raw edges of the framing for the power and signal entrance boxes, and exhaust blower, shall be sealed to provide a vapor barrier against entrance of moisture to the core material of the shelter panels and to the interior of the shelter. All joints and edges shall be assembled and sealed in a manner to prevent collection and retention of moisture. All exterior rivets, screws, and fasteners shall be dipped in sealer prior to installation. The sealer shall have the following properties. (See 4.14)

3.16.1 Sealer shear at temperature.- The minimum shear strength of the fully cured sealer and its bond to aluminum shall be as follows:

200 psi at ambient ( $80^{\circ} \text{ F} \pm 15^{\circ}$ )  
 200 psi at  $65^{\circ} \text{ F} \pm 5^{\circ}$   
 75 psi at  $200^{\circ} \text{ F} \pm 5$

3.16.2 Sealer shear after humidity exposure.- The sealer shall withstand exposure to 100 percent relative humidity at  $160^{\circ} \text{ F}, \pm 5^{\circ}$  for a 2-week period and shall have a shear strength of 200 psi minimum.

3.16.3 Sealer shear after salt spray exposure.- After a 2-week exposure to 20 percent NaCl solution at  $95^{\circ} \text{ F}$ , the sealer shall have a shear strength of 200 psi minimum.

3.17 Securing of parts.- Brackets, lugs, flanges, inserts, bolts, and other mounting arrangements shall retain components of the facility securely so that loosening, wear of mounting arrangements, or permanent separation of parts or components will not occur when the equipment is subjected to the specified drop and transport tests.

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3.17.1 Screws, threaded devices, and related parts.- Screws, threaded devices and related parts shall be as defined by the model. Thread forming screws shall not be used.

### 3.18 Soldering.-

3.18.1 Solder and flux.- Solder and flux shall be as defined on the drawings in accordance with specifications QQ-S-571 and MIL-F-14256, respectively.

3.18.2 Acid or acid salts.- No acid or acid salts shall be used in preparation for or during soldering; however, exception is permitted for preliminary tinning of electrical connections and for tinning of electrical connections and for tinning or soldering of mechanical joints not used to complete electrical circuits, but in no case shall acid or acid salts be used where they can come in contact with insulation material. Where acid or acid salts are used, as permitted above, they shall be completely neutralized and removed immediately after use.

3.18.3 Process.- There shall be no sharp points or rough surfaces resulting from insufficient heating. The solder shall feather out to a thin edge, heated, or under heated. The minimum necessary amount of flux and solder shall be used for electrical connections. Any means employed to remove an unavoidable excess of flux shall not incur the risk of loose particles of flux, brush bristles, or other foreign material remaining in the equipment; flux being spread over a larger area; or damage to the equipment. Insulation material that has been subjected to heating during the soldering operation shall be undamaged and parts fastened thereto shall not have become loosened.

3.19 Tropicalization of material.- Canvas, webbing, wood, etc shall be treated to be resistant to moisture and fungi as indicated in this specification and as follows:

3.19.1 Treating materials.- Treating materials containing a mercury-bearing fungicide shall not be used. The contractor shall determine that the treating material is compatible with the material or surface to be treated. Selection of treating materials shall be such that any increase in flammability of treated material will be held to the practical minimum.

3.19.2 Toxicity.- Treating materials shall cause no skin irritation or other injury to personnel handling the treated material during fabrication, transportation, operation, or maintenance of the equipment, or during use of the finished items when used for the purpose intended.

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3.19.3 Flexibility.-- Treatment shall not affect the flexibility of treated materials, to the extent that the equipment may fail to meet specified requirements when subjected to specified service conditions.

3.19.4 Statement of treatment.-- The contractor shall submit for approval, to the contracting officer, a statement describing in detail the materials to be treated and the treating materials and processes that he proposes to use.  
(See 6.2e)

3.20 Welding.-- Welded joints shall be as defined by the drawings and shall be such that grinding on the finished weld will be unnecessary. Spot, stitch, and seam welds shall conform to Specification MIL-W-6858, Class B. All surfaces to be welded shall be cleaned in accordance with good commercial practice and shall be free from scale, paint, grease and other foreign materials. Welds shall have thorough penetration and good fusion and shall be free from scabs, blisters, abnormal pock marks, cracks, voids, slag inclusions, and other harmful defects. Inert-gas-shielded arc welding shall be used for welding of aluminum except where spot welds are used. Welded assemblies shall be cleaned to remove any scale, oxidation products, and excess flux. Any acid used in cleaning shall be completely neutralized and removed.  
(See 4.4)

3.21 Wiring and cabling.-- Wiring and cabling shall be in accordance with the model and shall be neat and sturdy.

3.21.1 Slack.-- Wires and cables shall be as short as practical except that sufficient slack shall be provided:

- a. To prevent undue stress on cable forms, wires, and connections.
- b. To facilitate field repair of broken or cut wires.
- c. To prevent chafing or breaking of wires due to repeated flexing of hinged parts.

3.21.2 Protection.-- Wires and cables shall be so placed and protected as to avoid contact with rough or irregular surfaces or sharp edges. Wires shall not be bent sharply where they enter insulation material.

3.21.3 Splicing.-- Wires in a continuous run between two terminals shall not be spliced during the wiring operation.

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3.21.4 Crimping of solderless terminal lugs.- Crimping of solderless terminal lugs shall be so accomplished that the connections will meet the resistance (voltage drop) and tensile strength requirements and tests of Specification MIL-T-7928. (See 4.4 and 4.15)

3.21.5 Identification of wiring.- Wiring shall be identified by color-coding and wire pair marking, as indicated by the model.

3.22 Interchangeability.- Like units, assemblies, subassemblies, and replaceable parts shall be physically and functionally interchangeable without modification of such items or of the equipment. (See 4.16) Individual items shall not be hand-picked for fit or performance. Reliance shall not be placed on any unspecified dimension, rating, characteristic, etc.

3.23 Workmanship.- The equipment shall be manufactured and assembled in accordance with the applicable portions of the following paragraphs:

- 3.3 Construction
- 3.4 Electrical installation
- 3.11 Mounting inserts
- 3.12 Cleaning
- 3.13 Finish
- 3.14 Marking
- 3.15 Riveting
- 3.16 Seal, vapor
- 3.17 Securing of parts
- 3.18 Soldering
- 3.19 Tropicalization
- 3.20 Welding
- 3.21 Wiring and cabling
- 3.22 Interchangeability

#### 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.

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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 4.18)

4.3 Preproduction inspection.- This inspection will be performed by the contractor on the first article 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, respectively). The preproduction inspection will normally be performed in this order:

- a. Mounting inserts
- b. Power wiring
- c. Signal wiring
- d. System operation
- e. Vehicular transportation
- f. Rail transportation
- g. Flat drop
- h. Rotational drop
- i. Watertightness
- j. Fording

The last tests performed shall be a repeat of the power, signal, and system tests. The remaining preproduction tests shall be performed in any order satisfactory to the contracting officer.

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Table I - Preproduction Inspection

Inspection (For additional preproduction inspection see 4.3)	Rqr Para	Insp Para
System operation	3.5	4.7
Vehicular transportation	3.6	4.8
Rail transportation	3.7	4.9
Mounting inserts	3.11	4.13.1
Sealer shear	3.16	4.14

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>
Cable assemblies	3.4.6
Suppression, RFI	3.4.7
Finish	3.13
Marking	3.14
Welding	3.20
Terminals	3.21.4

4.5 Quality conformance inspection of equipment before preparation for delivery.- 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. 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 6.6) Test equipment for government verification inspection shall be made available by the contractor.

4.5.1 Group A inspection.- This inspection, including sampling, shall conform to Table II and the inspection procedures of Standard MIL-STD-105 using the general inspection levels.

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Table II - Group A Inspection

Inspection	Rqr Para	Insp Para	AQL	
			Major	Minor
<u>Visual and Mechanical</u>	3.23	4.17	1.5 dphm*	6.5 dphm
<u>Electrical</u>				**
<u>Power wiring</u>				
Continuity	3.4.1.1	4.6.1.1		
Dielectric strength	3.4.1.2	4.6.1.2		
Insulation resistance	3.4.1.3	4.6.1.3		
<u>Overvoltage control</u>				
Dielectric strength	3.4.2.1	4.6.2.1		
Insulation resistance	3.4.2.2	4.6.2.2		
Voltage drop	3.4.2.3	4.6.2.3		
<u>Power distribution</u>	3.4.3	4.6.3 thru 4.6.3.3		
<u>Signal wiring</u>				
Continuity & circuit resistance	3.4.4.1	4.6.4.1		
Dielectric strength	3.4.4.2	4.6.4.2		
Insulation resistance	3.4.4.3	4.6.4.3		
<u>Video system</u>				
Continuity & circuit resistance	3.4.5.1	4.6.5.1		
Dielectric strength	3.4.5.2	4.6.5.2		
Insulation resistance	3.4.5.3	4.6.5.3		
* Defects per hundred units				
** All defects are major				



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**4.5.2 Group B inspection.**- This inspection, including sampling, shall conform to Table III and to the procedures for small-sample inspection of Standard MIL-STD-105, using the special inspection levels. 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.

**4.5.2.1 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</u>
4.0%	S-4
6.5%	S-4

**4.5.2.2 Order of inspection within Group B.**- Group B inspection shall be performed on the same equipment in the order in which they appear.

Table III - Group B Inspection

<u>Inspection</u>	<u>Rqr</u> <u>Para</u>	<u>Insp</u> <u>Para</u>	<u>AQL</u> (See 4.5.2.1)
Mounting insert	3.11	4.13.2	4.0%
Watertightness	3.9	4.11	6.5%
Fording	3.10	4.12	6.5%
Interchangeability	3.22	4.16	4.0%

**4.5.3 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 and met Group A and Group B inspection.

Table IV - Group C Inspection

<u>Inspection</u>	<u>Rqr</u> <u>Para</u>	<u>Insp</u> <u>Para</u>
Drops, flat and rotational	3.8	4.10
Solderless-terminal-lug connection	3.21.4	4.15

**4.5.3.1 Sampling for inspection of drop tests.**- One sample shall be selected at random from the first 50 units or fraction thereof, and one sample from each additional 150 units or fraction thereof, produced and subjected to the drop tests.

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4.5.3.2 Sampling for inspection of solderless-terminal-lug connections.- Five specimens of each combination of wire and terminal shall be prepared each week for inspection. A specimen is a 1 foot length of wire on which a terminal lug has been applied, using the same tools and procedures used in crimping the terminal lugs in production.

4.5.3.3 Noncompliance.- The contractor shall immediately report in writing each Group C failure occurrence, including details of the failure and characteristics affected. The contractor shall immediately investigate the cause of failure and further report the results of investigation and details of the proposed corrective action on (i) the process and materials, as applicable, and (ii) all units or product which were manufactured under the same conditions and which the government considers subject to the same failure. Reports shall be forwarded to the responsible technical activity designated in the contract through the Quality Assurance Representative.

After corrective action has been taken, additional sample units shall be subjected to Group C inspection (all inspection, or the inspections which the sample failed, at the option of the government) and Groups A and B inspection may be reinstituted; reinspection results have shown that the corrective action was effective.

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

4.5.5 Alternate inspection procedures.- Contractor may elect to use a continuous sampling and inspection plan instead of the lot inspection plan stated in 4.5.1 and 4.5.2. If this alternate is selected the procedure of implementation must be in accordance with MIL-STD-1235, "Single and Multilevel Continuous Sampling Procedures and Tables for Inspection by Attributes". Before starting production Contractor shall notify the contracting office in writing which method he intends to use. The method may not be changed during production without written approval of the Government.

4.6 Electrical installation tests.- The tests of 4.6.1 through 4.6.5.3b shall be performed on each shelter facility prior to installation of other major components comprising the AN/TCG-62 or dummy loads. Before applying power to the shelter facility, an electrical ground at the Power Entrance Box shall be made. Power to the shelter facility shall be 115 VAC, 60 cycles, single phase.

4.6.1 Power system and components installation tests.- Prior to conducting power wiring and components tests of 4.6.1.1, 4.6.1.2 and 4.6.1.3, the following shall be accomplished:

- a. Remove or disconnect the following electrical loads:
  - (1) Fluorescent lamps and lamp starters

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- (2) Incandescent cold start lamps.
- (3) Power distribution box neon indicator lamps
- (4) Power indicator neon lamp
- (5) Blowers (1 & 2)
- (6) Heaters

b. Remove power distribution box cover panel and disconnect both conductors from the voltmeter terminals. Position or insulate disconnected leads so that they do not short to each other or to ground.

c. Fabricate test cable assembly shown in Figure 1. Connect test cable between power cable marked "Input to CN-514," and power cable marked "Output Overvoltage Control."

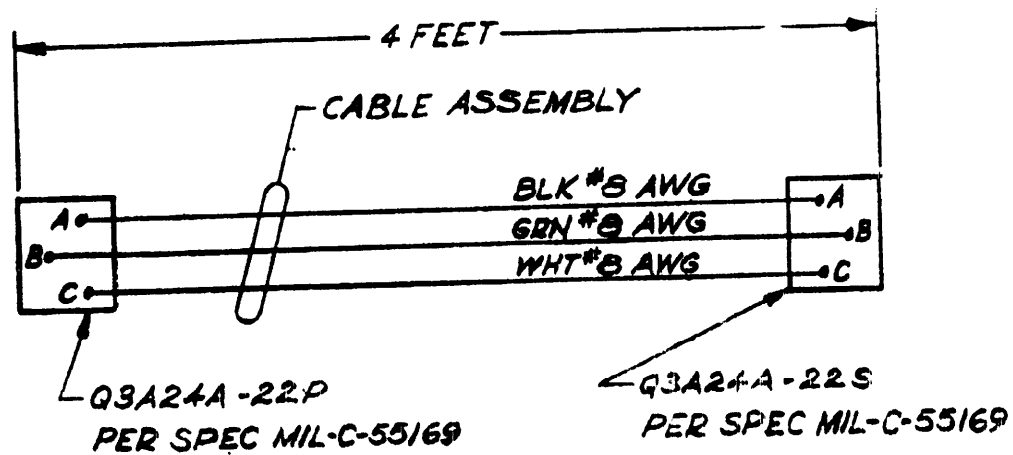


FIG. 1

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**4.6.1.1 Continuity of conductors.**-- Continuity measurements which satisfy the requirements 3.4.1.1 shall be made on each power-line circuit as indicated by the following paragraphs using an aural or visual indicating continuity test instrument and suitable test jig. The instrument shall produce a test current between 0.2 and 2.0 amperes AC when circuit continuity exists.

a. Remove and extend all connected power receptacles from wireway so that the outlet mounting brackets do not make electrical contact to the wireway. (See Figure No.2)

b. Place the following circuit controls in the ON position:

- (1) Fluorescent lamp switch
- (2) Incandescent cold start switch
- (3) Bypass blackout switch
- (4) Main circuit breaker
- (5) Branch circuit breakers
- (6) System circuit breakers
- (7) Blower switches

c. Measure continuity from Pin 1 (of power IN connector in power entrance box) to the following: brass contact on each receptacle, black wire termination at each fluorescent lamp and black wire termination at each incandescent lamp.

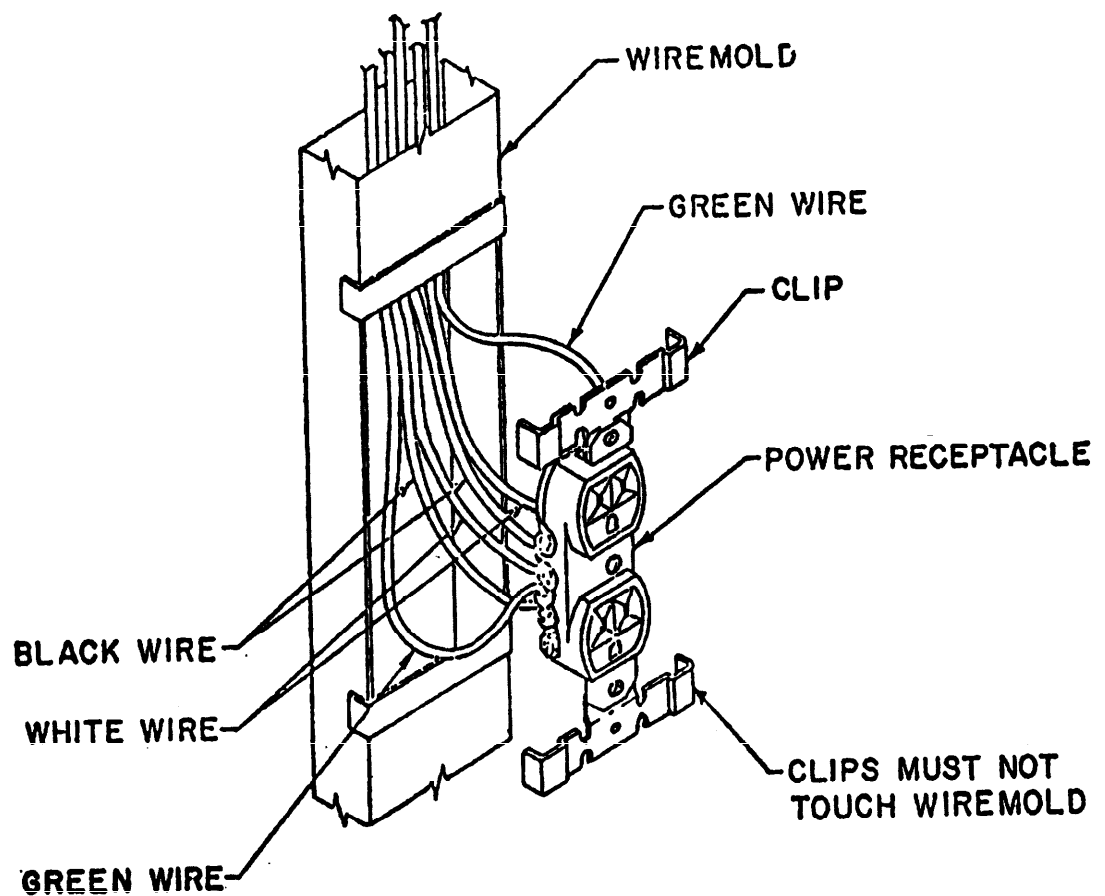
d. Place all controls listed under procedure 4.6.1.1b in OFF position, except main circuit breaker.

e. Measure continuity from Pin 2 (of power IN connector) to the following: silver contacts on each receptacle; black wire termination at each fluorescent lamp and black wire termination at each incandescent lamp.

f. Place main circuit breaker in OFF position.

g. Measure continuity from Pin 4 (ground) (of power in connector) to each ground terminal on receptacles.

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POWER RECEPTACLE REMOVED  
& EXTENDED FROM WIREMOLD

FIGURE NO. 2

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h. Measure continuity from Pin 4 (ground) (of power in connector) to shelter ground terminal located in power entrance box panel.

i. Measure continuity from Pin 1 of IN connector to Pin 1 of OUT connector; from Pin 2 of IN connector to Pin 2 of OUT connector; and from Pin 4 of IN connector to Pin 4 of OUT connector.

j. Replace and secure power receptacles removed by procedure 4.6.1.1a.

k. Measurements made by 4.6.1.1c,e,g,h, and i shall indicate existence of electrical circuit continuity. (See 3.4.1.1)

**4.6.1.2 Dielectric strength of insulation.-** Dielectric strength of insulation tests which satisfy the requirements of 3.4.1.2 shall be made on each power-line circuit indicated by the following paragraphs (Method 301 of MIL-STD-202, shall be employed using a nondestructive DC dielectric tester):

a. Place all circuit controls listed in procedure 4.6.1.1b in the ON position.

b. Connect tester between Pin 1 and Pin 2 of power IN connector in power entrance box. Adjust tester for a value of 600 volts DC and maintain this potential for a period of 30 seconds. The requirements of 3.4.1.2 shall be met.

c. Repeat procedure 4.6.1.2b with tester connected between Pin 1 and Pin 4 of power IN connector.

d. Repeat procedure 4.6.1.2b with tester connected between Pin 2 and Pin 4 of power IN connector.

**NOTE: To Eliminate danger of shock.-** Discharge conductors following each test by connecting a 10 to 60 ohm wirewound resistor (or equivalent test lamp) to the pins tested.

**4.6.1.3 Insulation resistance.-** Insulation resistance tests which satisfy the requirements of 3.4.1.3, shall be made on each power-line circuit indicated by the following paragraph (Method 302 of MIL-STD-202 shall be employed using a megohmmeter or equivalent tester):

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a. Connect tester between Pin 1 and Pin 2 of power IN connector in power entrance box. Adjust tester for a value of not less than 100 nor more than 600 volts DC. Maintain this potential for 1 minute or until the indicating meter has ceased fluctuating and indicates a steady or increasing insulation resistance. The requirements of 3.4.1.3 shall be met.

b. Repeat procedure 4.6.1.3 a with tester connected between Pin 1 and Pin 4 of power IN connector.

c. Repeat procedure 4.6.1.3a with tester connected between Pin 2 and Pin 4 of power IN connector.

**NOTE:** To Eliminate danger of shock: Discharge conductors following each test by connecting a 10 to 60 ohm wirewound resistor (or equivalent test lamp) to the pins tested.

**4.6.2 Overvoltage control test.-** Verification of the electrical requirements of 3.4.2 shall be made by measurements as indicated in 4.6.2.1, 4.6.2.2, and 4.6.2.3, referenced to drawing SC-C-532288.

**4.6.2.1 Dielectric strength of insulation.-**

a. Employing method 301 of MIL-STD-202, connect a nondestructive DC dielectric tester between PIN A and Pin C of connector P3. Adjust tester for a value of 600 volts DC and maintain this potential for a period of 30 seconds. The requirements of 3.4.2.1 shall be met.

b. Repeat procedure 4.6.2.1a with tester connected between Pin A and Pin B of connector P3.

c. Repeat procedure 4.6.2.1a with tester connected between Pin B and Pin C of connector P3.

d. Repeat procedure 4.6.2.1a, b, and c for connector P4 pins A, B, and C.

**4.6.2.2 Insulation resistance.-**

a. Employing method 302 of MIL-STD-202, connect a DC megohmmeter or equivalent tester between Pin A and Pin C of connector P3. Adjust tester for a value of not less than 100 nor more than 600 volts DC and maintain this potential for 1 minute or until the indicating meter has ceased fluctuating and indicates a steady or increasing insulation resistance. The requirements of 3.4.2.2 shall be met.

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b. Repeat procedure 4.6.2.2a with tester connected between Pin A and Pin B of connector P3.

c. Repeat procedure 4.6.2.2a with tester connected between Pin B and Pin C of connector P3.

d. Repeat procedure 4.6.2.2a, b, and c for connector P4 pins A, B, and C.

#### 4.6.2.3 Voltage drops.-

a. Connect 115 volts AC (nominal), 60 cycles, across Pins A and C of connector P3.

b. Connect a resistive load across pins A and C of connector P4 to produce a current of approximately  $50 \pm 5$  amps.

c. Place switch on overvoltage control unit in ON position. Neon lamp on overvoltage control unit shall light.

d. Measure voltage drop between Pin A of connector P3 and Pin A of connector P4. The requirements of 3.4.2.3 shall be met.

e. Repeat procedure 4.6.2.3d for Pin C of connector P3, and Pin C of connector P4.

4.6.3 Power distribution and operational functions tests.- Power distribution and operational functions tests which satisfy the requirements of 3.4.3 shall be made as indicated by the following paragraphs:

#### 4.6.3.1 Test preparation.-

a. Replace or reconnect all electrical loads and line voltmeter removed or disconnected by procedure 4.6.1a and b.

b. Replace power distribution box cover.

c. Replace test cable assembly installed by 4.6.1c. Connect power cable connector marked "Input to GN-514" to connector P3 and power cable connector marked "Output Overvoltage Control" to connector P4 of overvoltage control unit.

d. Place circuit breakers and switches in the OFF position.

e. Place a 115 volt AC test lamp with grounding type plug into each convenience and equipment receptacle.

f. Open (and secure open) outer exhaust port covers of blowers 1 and 2.



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- g. Place by-pass blackout switch in the ON position.
- h. Insert AC line plugs of exhaust blowers (1 and 2) into their receptacles.
- i. Insert AC line plug of heaters into their receptacles. Place heater switches in FAN position.

#### 4.6.3.2 Line voltmeter and indicator lamp.-

- a. Apply 115 volt AC (nominal), 60 cycles, power to power IN connector in power entrance box. Power indicator neon lamp shall light; test lamp in each receptacle convenience outlet shall light; and facility voltmeter in power distribution panel shall indicate power to the shelter.
- b. Measure specific line voltage by connecting a calibrated external AC voltmeter between Pin 1 and Pin 2 of power OUT connector.
- c. Read voltage indicated on facility voltmeter. The voltage read shall be within 3% of the voltage read by 4.6.3.2b.
- d. Place main circuit breaker in ON position.

#### 4.6.3.3 Circuit breakers and switches.-

##### Circuit No.1.- (Lights circuit breaker)

- a. Place circuit breaker #1 in the ON position. Neon lamp shall light.
- b. Place fluorescent light switch in ON position. All fluorescent lamps, shall light.
- c. Place incandescent light switch in ON position. Incandescent lamps shall light.
- d. Place circuit breaker #1 in OFF position. Neon lamp and all fluorescent and incandescent lamps shall go out.

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e. Place circuit breaker #1 in ON position. With shelter door open, place by-pass blackout switch in OFF position. All fluorescent and incandescent lamps shall go out.

f. Close shelter door. All fluorescent and incandescent lamps shall light.

g. Open door and place by-pass blackout switch in ON position.

Circuit No.2.- (Blowers circuit breaker)

a. Place circuit breaker #2 in ON position. Neon lamp shall light.

b. Place blower 1 switch in ON position. Blower 1 shall operate.

c. Place blower 2 switch in ON position. Blower 2 shall operate.

d. Place circuit breaker in OFF position. Neon lamp shall go out and blowers 1 and 2 shall stop.

Circuit No.3.- (Heater circuit breaker)

a. Place circuit breaker in ON position. Neon lamp shall light and heater fan shall operate and blow air.

b. Place thermostat control on heater to a high heating position. Place heater-1 in Heat position. Ammeter shall indicate approximately 15 amps. After a few minutes the heater shall blow warm air. Check that the thermostat controls heater operation by turning thermostat to a colder temperature setting. When the lower temperature is reached, a click will be heard and the shelter's ammeter shall show a drop of about 13 amps. The fan shall continue to blow.

c. Place circuit breaker #3 in the OFF position. Neon lamp DS 3 shall go out and heater shall cease to operate.

d. Repeat b and c for Heater-2.

Circuit No.4.- (Convenience and intercom circuit breaker)

a. Place circuit breaker #4 in ON position. Neon lamp shall light and test lamp in each associated receptacle of shall light.

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b. Place circuit breaker #4 in OFF position. Neon lamp shall go out. Test lamp in each receptacle shall go out.

Circuit No.5.- (Equipment circuit breaker)

- a. Place circuit breaker #5 in ON position. Neon lamp shall light.
- b. Place circuit breaker #5 in OFF position. Neon lamp shall go out.

Circuit No.6.- (Spare circuit breaker)

- a. Place circuit breaker #6 in ON position. Neon lamp shall light.
- b. Place circuit breaker #6 in OFF position. Neon lamp shall go out.

Circuit No.7.- (Main circuit breaker #7)

- a. Place circuit breakers #1 thru #7 in ON position. All lamps shall light. Blowers and heaters shall operate. Test lamp in each convenience receptacle shall light.
- b. Place circuit breaker #7 in OFF position. All lamps shall go out. Blowers and heaters shall cease to operate. Test lamp in each receptacle shall go out.
- c. Place circuit breakers #2 thru #6 in OFF position.

Circuit No.8.- (Rack equipment Roadside, circuit breaker #8)

- a. Place circuit breakers #5 & #7 (Main) in ON position. Place switch of overvoltage control unit in ON position. Neon lamp on this unit shall light.
- b. Place circuit breaker #8 in ON position. Test lamp in each receptacle of roadside rack equipments shall light.
- c. Place circuit breaker #8 in OFF position. Test lamp in each receptacle of roadside rack equipments shall go out.

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Circuit No.9.- (Rack equipment curbside, circuit breaker #9)

- a. Place circuit breaker #9 in ON position. Test lamp in each receptacle of curbside rack equipments shall light.
- b. Place circuit breaker #9 in OFF position. Test lamp in each receptacle of curbside rack equipments shall go out.

Circuit No.10.- (Outside convenience circuit breaker #10). Reset circuit breaker #10 in ON position. Test lamp in each receptacle of the convenience outlet shall light.

Overvoltage control circuit.-

- a. Place circuit breakers #5, #8, and #9 in ON position. Neon lamp #5 shall light. Place switch in overvoltage control unit in ON position. Neon lamp on overvoltage control unit shall light and test lamp in each receptacle of roadside and curbside rack equipments shall light.
- b. Place overvoltage control switch to OFF position. Neon lamp on this unit and test lamps in each receptacle shall go out. Replace overvoltage control switch to ON position.
- c. Place circuit breaker #5 in OFF position. Neon lamp shall go out. Neon lamp on overvoltage control unit shall go out. Test lamp on each receptacle shall go out.
- d. Place circuit breaker #5 in ON position. Only neon lamp #5 shall light.

4.6.4 Signal (audio) system wiring and components installation tests.-

4.6.4.1 Continuity and circuit resistance.- Continuity resistance which satisfy the requirements of 3.4.4.1 shall be made on each audio circuit indicated by the following paragraphs (using a low resistance continuity tester or equivalent, producing a test current of not more than 0.010 amps.)

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a. Place all CABLE/BINDING POST channel switches, S1 thru S12, of system 1 thru system 8, in the BINDING POST position.

b. Connect tester between Pin A (of audio connector Channels 1-4, System 1)(of audio connector System 1, in signal entrance box) no circuit continuity shall exist.

c. Place channel switch S1 of system 1 to CABLE position. Circuit continuity shall exist and meet the requirements of 3.4.4.1. Replace channel switch S1 to BINDING POST position.

d. Disconnect tester leads from Pin A of audio connector Channels 1-4, System 1 and Pin 2B of System 1 26 pair connector.

e. Repeat procedures 4.6.4.1b thru d for each remaining conductor (Pin B thru Pin S of audio connector) to its corresponding pin of audio (26 pair) connector as follows: each time placing to CABLE position the channel switch correlating with the circuit being tested and replacing to BINDING POST position following completion of test.

Audio Connector Pin		26 Pair connector Terminal			
Channels	1-4	Channels	Channels	Channels	
Channels	5-8	1-4	5-8	9-12	
Channels	9-12				
A		2B	10B	18B	
B		2A	10A	18A	
C		1B	9B	17B	
D		1A	9A	17A	
E		6B	14B	22B	
F		6A	14A	22A	
G		5B	13B	21B	
H		5A	13A	21A	
J		4B	12B	20B	
K		4A	12A	20A	
L		3B	11B	19B	
M		3A	11A	19A	
N		8B	16B	24B	
P		8A	16A	24A	
R		7B	15B	23B	
S		7A	15A	23A	

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f. Repeat procedures 4.6.4.1a thru e for each conductor terminated at audio connectors channels 5-8 and channels 9-12 of system 1.

g. Repeat procedures 4.6.4.1b thru f for each conductor terminated in audio connectors of system 2 thru system 8.

h. Place all CABLE/BINDING POST channel switches, S1 thru S12 of system 1 thru system 8, to CABLE position.

i. Connect tester between Pin A of audio connector channels 1-4 and binding post 2b system 1, in signal entrance box. No circuit continuity shall exist.

j. Place channel switch S1 of system 1 to BINDING POST position. Circuit continuity shall exist and meet the requirements of 3.4.4.1. Replace channel switch S1 to CABLE position.

k. Disconnect tester leads from Pin A of audio connector and binding post 2b system 1.

l. Repeat procedure 4.6.4.1i thru k for each of the remaining conductor (Pin B thru Pin S of audio connector) to its corresponding binding post of system 1; each time placing to BINDING POST position the channel switch correlating with the circuit being tested and replacing to CABLE position following test.

m. Repeat procedures 4.6.4.1i thru l for each conductor terminated at audio connectors channels 5-8 and channels 9-12 of system 1.

n. Repeat procedures 4.6.4.1i thru m for each conductor terminated on audio connectors of system 2 thru system 8.

o. Connect phone/intercom parallel interconnecting cable assembly between the phone/intercom plugs located on power entrance panel and signal entrance panel.

p. Circuit continuity that meets the requirements of 3.4.4.1 shall exist between the following points:

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From tip of Phone Jack to:

Pin 25A of audio connector (26 pair) system 1 thru system 8.  
Binding post 25A of system 1 thru system 8.  
Phone A binding post at power entrance box.

From sleeve of Phone Jack to:

Pin 25B of audio connector (26 pair) system 1 thru system 8.  
Binding post 25B of system 1 thru system 8.  
Phone B binding post at power entrance box.

From tip of Intercom Jack to:

Pin 26A of audio connector (26 pair) system 1 thru system 8.  
Binding post 26A of system 1 thru system 8.  
Intercom A binding post at power entrance box.

From sleeve of Intercom Jack to:

Pin 26B of audio connector (26 pair) system 1 thru system 8.  
Binding post 26B of system 1 thru system 8.  
Intercom B binding post at power entrance box.

**4.6.4.2 Dielectric strength of insulation.-** Dielectric strength of insulation tests which satisfy the requirements of 3.4.4.2 shall be made for each audio circuit indicated by the following paragraphs (Method 301 of MIL-STD-202 shall be used utilizing a non-destructive dielectric test instrument and suitable test jigs or an automatic tester may be used subject to government approval):

a. Place all CABLE/BINDING POST channel switches, S1 thru S12 of system 1 thru system 8 in the CABLE position.

b. Connect the following to facility ground terminal:

(1) Pins 1A thru 26B of audio connector (26 pair) system 1 thru system 8.

(2) Binding posts 1A thru 26B of system 1 thru system 8.

(3) All phone and intercom binding posts in power entrance box.

(4) Shields of audio connectors channels 1-4, 5-8, and 9-12 of system 1 thru system 8.

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- c. Connect tester between the facility ground terminal and pin A of audio connector channels 1-4, system 1. Remove ground connection from Pin 2B of audio connector (26 pair) system 1.
- d. Adjust tester to 600 volts DC output and maintain this potential for a continuous period of not less than 5 seconds the requirements of 3.4.4.2 shall be met.
- e. Disconnect tester lead from Pin A of audio connector Channels 1-4 system 1 and re-establish ground connection to Pin 2B of audio connector (26 pair) system 1.
- f. Repeat procedures 4.6.4.2c thru e for each remaining conductor (Pin B thru Pin S of audio connector channels 1-4, system 1) each time ungrounding the pin of audio connector (26 pair) system 1 correlating with the circuit being tested and reconnecting pin to facility ground terminal following completion of the test. (See 4.6.4.1e)
- g. Repeat procedures 4.6.4.2c thru f for each conductor terminated on audio connectors channels 5-8 and channels 9-12 of system 1.
- h. Repeat procedures 4.6.4.2c thru g for each conductor terminated in audio connectors of system 2 thru system 8.
- i. Place all CABLE/BINDING POST channel switches, S1 thru S12 of system 1 thru system 8, in the BINDING POST position.
- j. Repeat procedures 4.6.4.2c thru h substituting binding post of system 1 thru system 8 for audio connector (26 pair) for system 1 thru system 8 respectively.
- k. Connect tester between the facility ground terminal and tip of phone jack. Remove ground connections from Pin 25A of audio connectors (26 pair) 1 thru 8; from binding post 25A of system 1 thru system 8; and from Phone A binding post in power entrance box.
- l. Repeat procedure 4.6.4.2d.
- m. Disconnect tester lead from tip of phone jack and re-establish ground connections to PIN 25A of audio connectors (26 pair) 1 thru 8, to binding post 25A of system 1 thru system 8; and to Phone A binding post in power entrance box.



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n. Repeat procedure 4.6.4.2j thru l for sleeve of phone jack, tip of intercom jack, and sleeve of intercom jack; each time ungrounding all pins and binding posts correlating with the circuit being tested and reconnecting all pins and binding posts to facility ground terminal following completion of test.

NOTE: To eliminate danger of shock: Discharge conductors following each test by connecting a 500 ohm wirewound resistor (or equivalent test lamp) to the pins tested.

4.6.4.3 Insulation resistance.- Insulation resistance which satisfy the requirements of 3.4.4.3 shall be made on each audio circuit indicated by the following paragraphs (Method 302 of MIL-STD-202 shall be used, utilizing a megohmmeter or equivalent tester, and suitable test jig or an automatic tester subject to government approval):

a. Repeat procedures 4.6.4.2a thru n, except 4.6.4.2d which shall be replaced by 4.6.4.3b below.

b. Adjust tester to 500 volts DC output. The requirements of 3.4.4.3 shall be met.

NOTE: To eliminate danger of shock: Discharge conductors following each test by connecting a 500 ohm wirewound resistor (or equivalent test lamp) to the pins tested.

#### 4.6.5 Video system wiring and components installation.-

4.6.5.1 Continuity and circuit resistance.- Continuity resistances which satisfy the requirements of 3.4.5.1 shall be made on each video circuit indicated by the following paragraph (using a low resistance continuity tester):

a. Connect tester between inner conductor of IN coaxial cable connector of roadside video entrance box and inner conductor of female connector of cable assembly marked VIDEO at roadside equipment rack. Circuit continuity shall exist and meet the requirements of 3.4.5.1.

b. Connect tester between outer conductors (Shields) of circuit under test. Circuit continuity shall exist and meet the requirements of 3.4.5.1.

c. Connect tester between shield of circuit under test and facility ground terminal. Circuit continuity shall exist and meet the requirements of 3.4.5.1.

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d. Connect tester between inner conductor of OUT coaxial cable connector of roadside video entrance box and inner conductor of male connector of cable assembly marked VIDEO in multiplexer rack. Circuit continuity shall exist and meet the requirements of 3.4.5.1.

e. Repeat procedures 4.6.5.1b and c.

f. Repeat procedures 4.6.5.1a thru e for IN and OUT coaxial cable connectors of curbside equipment.

4.6.5.2 Dielectric strength of insulation.- Dielectric strength of insulation tests which satisfy the requirements of 3.4.5.2 shall be made on each video circuit indicated by the following paragraphs (Method 301 of MIL-STD-202 shall be used utilizing a non-destructive dielectric tester):

a. Disconnect all video cable assemblies from their respective equipment. Position or separate the unconnected video connectors so that none are shorted to each other or to facility ground.

b. Remove all lightning protector elements.

c. Connect tester between inner conductor of IN coaxial cable connector of roadside video entrance box and the facility ground terminal.

d. Adjust tester to 1700 volts DC output and maintain this potential for a continuous period of not less than 30 seconds. The requirements of 3.4.5.2 shall be met.

e. Disconnect tester lead from inner conductor of IN coaxial cable connector of roadside equipment.

f. Repeat procedures 4.6.4.1c thru e for inner conductor of OUT coaxial cable connector of roadside equipment; and for inner conductor of IN and OUT coaxial cable connectors curbside equipment.

g. Replace all lightning protector elements removed by 4.6.5.2b.

h. Connect tester between inner conductor of IN coaxial cable connector of roadside video entrance box and the facility ground terminal.

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i. Adjust tester to 1200 volts DC output and maintain this potential for a continuous period of not less than 30 seconds. The requirements of 3.4.5.2 shall be met.

j. Disconnect tester lead from inner conductor of IN coaxial cable connector of roadside equipment.

k. Repeat procedures 4.6.5.2h thru j for inner conductor of OUT coaxial cable connector of roadside equipment; and for inner conductor of IN and OUT coaxial cable connectors of roadside equipment.

**NOTE:** To eliminate danger of shock: Take preventive measures that will preclude personnel coming in contact with connectors inside the shelter during performance of tests.

4.6.5.3 Insulation resistance.- Insulation resistance tests which satisfy the requirements of 3.4.5.3 shall be made on each video circuit indicated by the following paragraphs (Method 302 of MIL-STD-202 shall be used utilizing a megohmmeter or equivalent tester):

a. Repeat procedures 4.6.5.2a thru f except 4.6.5.2d which shall be replaced by 4.6.5.3b below.

b. Adjust tester to 1000 volts DC output and maintain this potential for a continuous period of not less than 30 seconds. The requirements of 3.4.5.3 shall be met.

**NOTE:** To eliminate danger of shock: Take preventive measures that will preclude personnel coming into contact with connectors inside the shelter during performance of tests.

4.7 System test.- Install operational equipments in their respective rack locations and connect power and signal cables to designated receptacles and connectors. Interconnect the TD-204()/U multiplexers (back-to-back operation).

a. Set converters for 20 cycle ringing.

b. Set TD-352()/U multiplexers in master mode.

c. Arrange switches in converters and multiplexers for 2-wire operation.

d. Connect a telephone set to BINDING POST pair 2 WT/R channel 1 for systems 1 and 5.

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- e. Set multiplexers for proper operation in accordance with instruction card on the equipment.
- f. Set switches on signal entrance boxes in BINDING POST position.
- g. Ring phone 2 from phone 1; ring phone 1 from phone 2; establish communications.
- h. Repeat g above with phones connected to 2 WT/R BINDING POSTS for remaining channels of systems 1 and 5.
- i. Arrange switches in converters and multiplexers for 4-wire operation.
- j. Connect phone 1 to BINDING POST pair 2 WT/R, channel 1, system 1; connect phone 2 to BINDING POST pair 4 wt, channel 1, system 5. Ring phone 1 from phone 2; receive communications at phone 1 from phone 2.
- k. Connect phone 1 to BINDING POST pair 4 wt, channel 1, system 1; connect phone 2 to BINDING POST pair 2 WT/R, channel 1, system 5. Ring phone 2 from phone 1; receive communications at phone 2 from phone 1.
- l. Repeat j & k above for remaining channels of systems 1 and 5.
- m. Repeat procedures of 4.7c thru l for systems 2 and 6; systems 3 and 7; systems 4 and 8.

4.8 Vehicular transportation test.- The facility shall be secured (and blocked to prevent shifting) to a government furnished (2½ ton, M-35, truck and transported over the specially prepared course described in 4.7.1 for 10 laps at a speed of 5 mph, 10 laps at a speed of 10 mph, 10 laps at a speed of 15 mph, and 10 laps at a speed of 18-20 mph. A lap is defined as traversing the course in one direction. The facility shall meet the requirements of paragraph 3.6 after completion of the test. (Note: The facility shall be loaded to simulate the AN/TCC-62() using live and dummy loads (See 6.2(b) for this test).

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**4.8.1 Vehicular transportation course.-** The course for the military truck transportation shall have twelve (12) 4-inch by 8-inch timbers placed 25 feet apart on the 8-inch face and with the 4-inch face fully above ground. The top edges shall have a 1 x 1-inch chamfer. The sixth and twelfth timbers shall be placed at 45 degrees to the direction of travel, and all other timbers shall be placed perpendicular to the direction of travel. The timbers shall be anchored securely by any convenient means. The ground on which the timbers are placed shall be hard and level.

**4.9 Rail transport, impact test.-** The shelter facility, with loads as specified in 4.7, shall be loaded onto a railroad flatcar in accordance with Figure 3. The test shall be conducted on a flat stretch of track. A loaded flatcar totaling 165,000 pounds (load on flatcar shall be constrained to prevent shifting during this test) traveling at 9 miles per hour (or equivalent conditions approved by the Government) shall be impacted against the stationary test flat car coupled to two empty boxcars, all with brakes off. Four impacts shall be performed, two impacts into each end of the test flatcar. The cabling or blocking holding the shelters in place shall be tight at the start of each impact run. If the cabling or blocking is torn loose by the impact, the run shall be repeated. A damage survey shall be made after each impact and the facility shall meet the requirements of 3.7.

**4.10 Drop tests.-**

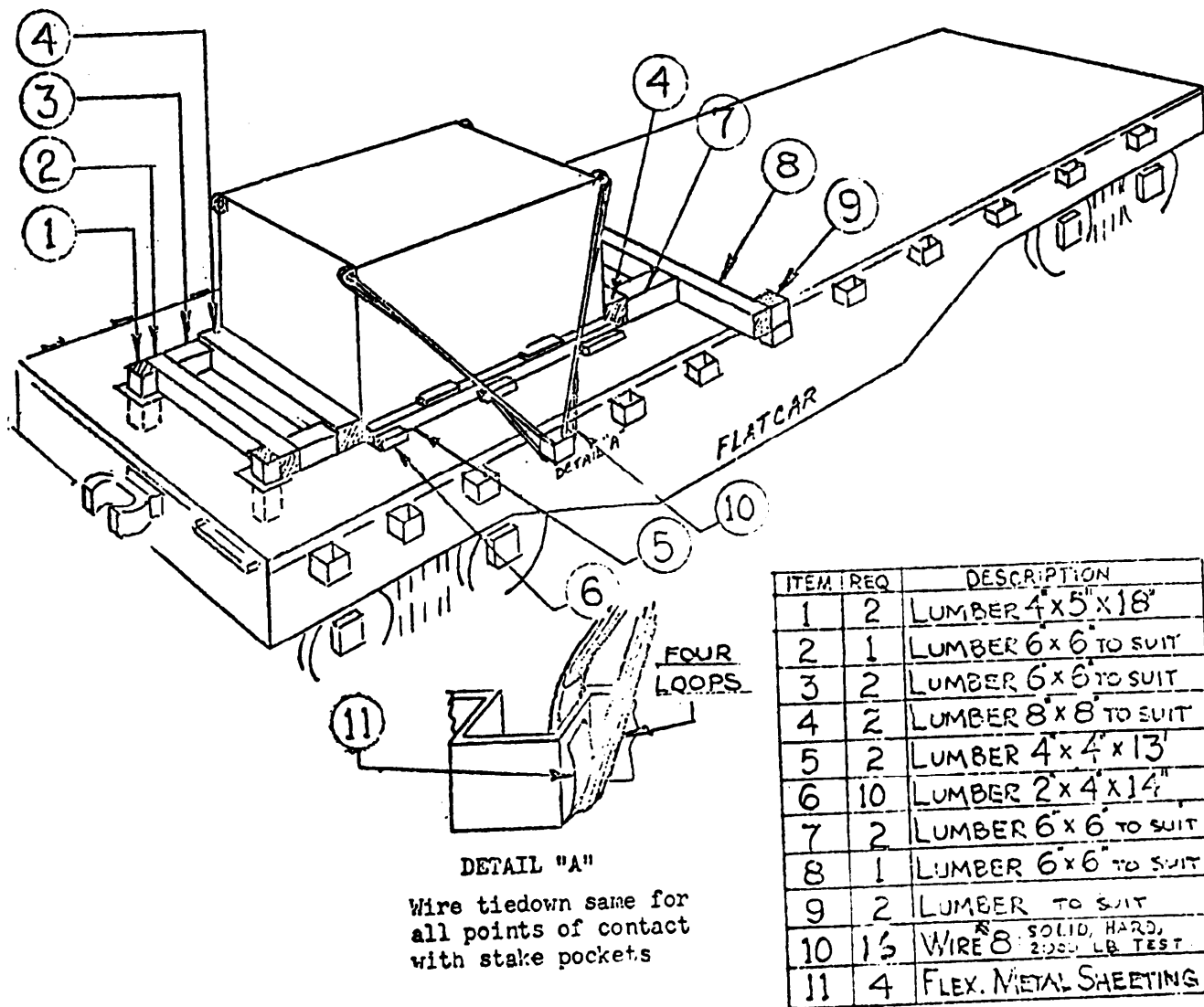
**4.10.1 Flat drop.-** The shelter facility loaded as in 4.7, shall be lifted 18 inches from the ground and allowed to fall freely with the skids impacting onto a hard concrete surface. The test shall be performed once. Upon completion of this drop, the facility shall meet the requirements of 3.8.

**4.10.2 Rotational drop.-** The shelter facility loaded as in 4.7, shall have one skid (or the knuckles of the skids) resting on a nominal 4 inch high timber. The outer edge of the opposite skid (or the opposite knuckles of the skids) shall be raised 18 inches and the shelter facility shall be allowed to fall freely onto a hard substantial concrete surface. This impact shall be performed four times, once for each bottom edge of the shelter facility. On completion of these drops, the shelter facility shall meet the requirements of 3.8.

**4.11 Watertightness test.-** The shelter facility, without the use of any additional external sealing, caulking, taping, etc. shall be subjected to the following two part test (Note: Perform tests with inside cover of entrance boxes removed):

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FIGURE #3



## NOTES:

- a. The blocking lumber shall be notched to accommodate towing eyes, bolts and rivet heads.
- b. The blocking lumber shall be rigidly fastened to the floor of the flatcar.

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a.. Each of the five exposed surfaces of the shelter facility, with covers closed, shall be sprayed with water from nozzles, model G 29SQ (or GG29SQ) as made by Spraying Systems Co., Bellwood, Illinois, or equal, pointing directly at the surface and arranged to provide uniform coverage of the surface. Each end panel shall be tested using nine nozzles, each side using nine nozzles, and the roof using four nozzles. Each nozzle shall operate at a pressure of forth psig at the nozzle, and shall be located nineteen inches from the panel with the exception of the roof nozzles which shall be at a distance of thirty-two inches. (See Figure 4 for nozzle location). Each panel shall be sprayed for a period of 20 minutes. (If the watertightness test is to be followed by the fording test of 4.12, the bottom row of nozzles may be eliminated with the exception of the nozzles facing the door-end panel). Upon completion of the above test, the shelter facility shall meet the requirements of 3.9. To determine that no water has entered the shelter panels, holes shall be made at points to be determined by the government at the time of testing. After this determination, the holes shall be sealed with rivets and sealer.

b. Repeat the test of 4.11a with covers open to their normal operating position.

4.12 Fording test.- The shelter facility shall be immersed in water for 1 hour to a depth of 21 inches (measured from the bottom of the skids) and meet the requirements of 3.10. No special fording kits shall be used. The shelter shall be restrained by external tiedowns. To determine that no water has entered the shelter panels, holes shall be made at points to be determined by the government at the time of testing. After this determination, the holes shall be sealed with rivets and sealer.

#### 4.13 Mounting insert tests.-

4.13.1 Preproduction insert test.- Four of each size insert shall be randomly selected for test. Each selected insert shall be tested with an axial load followed by a torque load in accordance with Table V. After test, the requirements of 3.11 shall be met. Failure of any insert shall be cause for rejection of the sample shelter facility.

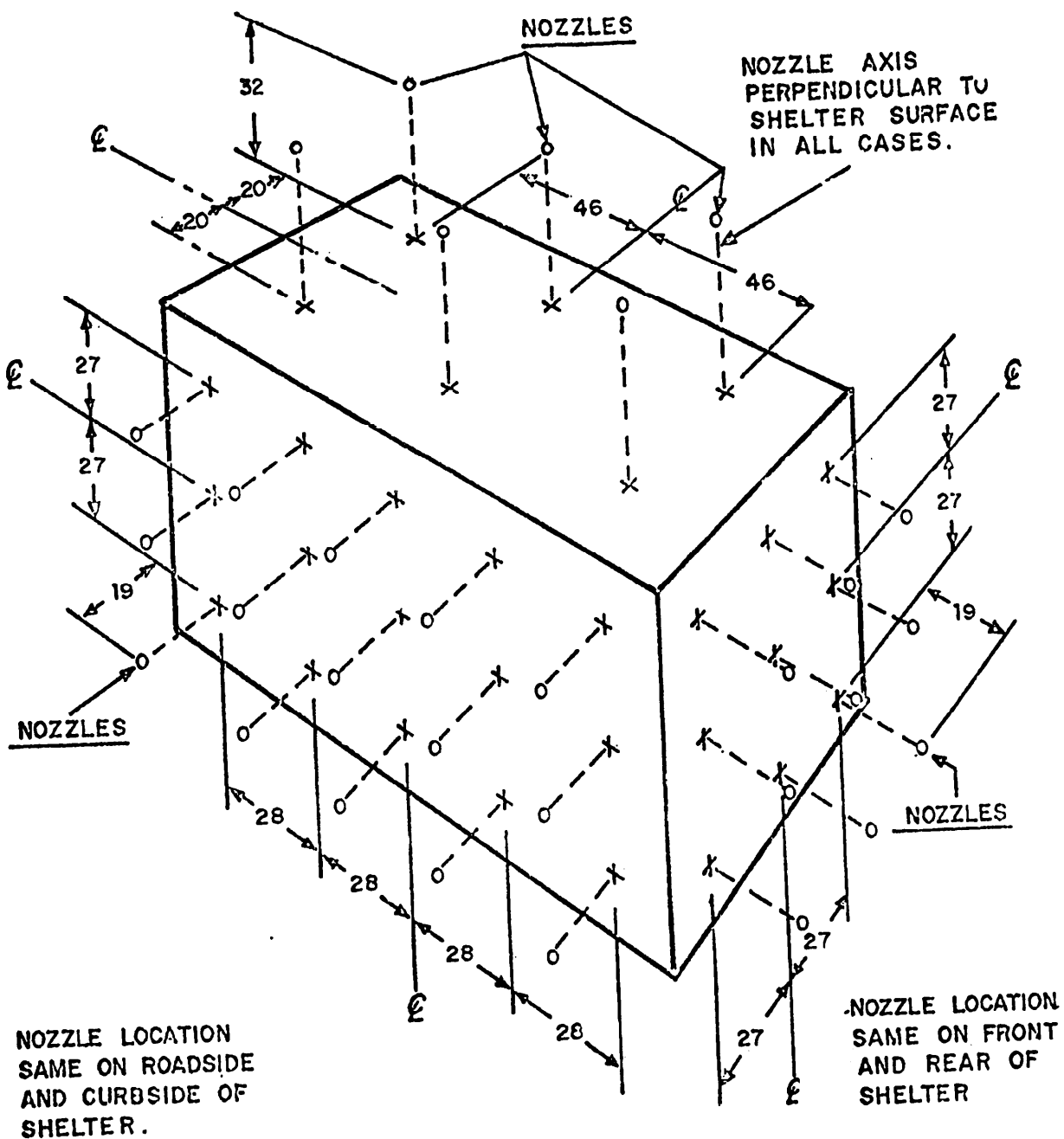
4.13.2 Production insert test.- Five of each size insert (if the total quantity of any size is less than five, all of that size shall be tested) shall be randomly selected for test in each sample shelter facility. Each selected insert shall be tested in accordance with Table V. After test, the requirements of 3.11 shall be met. Failure of any insert shall be cause for rejection of the sample shelter facility.

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FIGURE #4

FIGURE  
NOZZLE LOCATION FOR TEST PER

TEST PER 4.11



**Note :**  
GAGES SHALL BE PERMANENTLY INSTALLED  
IN PIPING TO INDICATE PRESSURE AT  
REMOTE NOZZLES.



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Table V - Mounting Inserts Loads

<u>Insert size</u>	<u>Preproduction Test</u>		<u>Production Test</u>	
	<u>Axial(lbs.)</u>	<u>Torque(in.-lbs.)</u>	<u>Axial(lbs.)</u>	<u>Torque(in.-lbs.)</u>
5/16-18	2000	100	1000	100
1/4-20	1300	60	650	60

NOTE: Torque loads applied through bolt whose head holds a stationary plate against head of insert.

4.14 Sealer shear tests.- A tensile pull test shall be performed on sample lap joints consisting of two one-inch wide strips of aluminum (0.062 inch thick) overlapped one-half inch, giving contact area of one-half square inch and bonded with sealer material over no more than the specified one-half square inch area. The samples shall be tested under the conditions of 4.14.1 through 4.14.3. Five test specimens shall be used for each condition and tests shall be to destruction with rate of application of load constant at one inch per minute maximum or one-half inch per minute minimum.

4.14.1 Shear at temperature.- Five samples shall be subjected to the above test at ambient temperature ( $80^{\circ} \pm 15^{\circ}$ ); five samples at  $-65^{\circ} \text{ F} \pm 5^{\circ}$ ; and five samples at  $200^{\circ} \text{ F} \pm 5^{\circ}$ . All samples shall meet respective requirements of 3.16.1. Temperature of samples shall be stabilized at specified level, as indicated by a thermocouple at the bond area.

4.14.2 Shear after humidity exposure.- Five samples shall be tested as specified in 4.14 after exposure to 100 per cent relative humidity at  $160^{\circ} \text{ F} \pm 5^{\circ}$  for 2 weeks and shall meet requirements of 3.16.2. Temperature of samples shall be stabilized at specified level when tested.

4.14.3 Shear after salt spray exposure.- Five samples shall be tested as specified in 4.13 for conformance to 3.16.3 after being subjected to the salt spray test of Standard MIL-STD-202 using a 20 per cent NaCl solution at  $95^{\circ} \text{ F}$  for a period of 2 weeks.

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4.15 Testing of solderless terminal-ing connections.- Connections made with solderless terminal-ings shall be tested for conformance to 3.21.4.

4.16 Inspection for interchangeability.- The dimensions listed below shall be gaged or measured to determine compliance with the physical interchangeability requirements of 3.22. When a dimension is not within specified or design limits, it shall be considered a defect.

- a. Size and mounting dimensions of brackets and mounting plates.
- b. Size and mounting dimensions of racks and cabinets.

4.17 Visual and mechanical inspection.- The shelter facility shall be examined for the defects listed in Standard MIL-STD-252, the requirements of 3.23 and Table VI.

Table VI - Classification of Visual and Mechanical Defects

Classification	Defects
Major	<ol style="list-style-type: none"> <li>1. Mounting plates missing or mislocated.</li> <li>2. Aircraft loading data plate, instruction or nameplate omitted, incorrect or illegible.</li> <li>3. Welds - cracked or porous.</li> <li>4. Sealer improperly applied (holes, separations, or lack of adhesion).</li> <li>5. Mounting inserts missing or mislocated.</li> <li>6. Burrs or sharp edges in wire duct not removed.</li> <li>7. Equipments or bracketry loose or missing.</li> <li>8. Doors, etc. inoperative.</li> <li>9. Power receptacles, switches, jacks, wire ducts or other electrical components loose, improperly located or inoperative.</li> <li>10. Locking or holding devices missing or inoperative.</li> <li>11. Gaps between sections of wire duct exceed 1/16".</li> </ol>
Minor	<ol style="list-style-type: none"> <li>1. Doors, not easily operable.</li> <li>2. Fastening devices difficult to operate.</li> <li>3. Finish - abrasions or scratches.</li> </ol>

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

**4.19 Rough handling test (preparation for delivery).**- When rough handling test in accordance with Specification MIL-P-116 is required by the contract, the following functional tests shall be conducted to determine freedom from operational malfunction caused by rough handling:

Paragraph 4.6.1 and 4.6.2  
Paragraph 4.17

Power and Signal wiring  
Visual and mechanical

## 5. PREPARATION FOR DELIVERY

**5.1 Preservation and packaging.**- Preservation, packaging, and packing of the shelter facility shall be in accordance with applicable requirements of Specification MIL-S-55505.

## 6. NOTES

**6.1 Intended use.**- The Shelter, Electrical Equipment S-302()/TCC-62 is the shelter facility portion of the AN/TCC-62() and it is used to house the operational equipments including:

- a. 2 ea TD-353()/U Multiplexer
- b. 2 ea TD-204()/U Multiplexer
- c. 8 ea CV-1548()/G Converter, Telephone Signal
- d. 1 ea CN-514()/GRC Voltage Regulator
- e. 1 ea TA-312()/PT Telephone
- f. 1 ea LS-147()/FI Intercom
- g. 2 ea Security Equipment (Optional)

forming the telephone terminal.

- h. 2 ea H-91()/U Headset Microphone.

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

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

b. Preproduction and Group C inspection of the shelter facility required use of contractor fabricated dummy loads for the communications security equipments (2 ea) and government furnished live loads (converters and multiplex components) unless otherwise specified in the bid request and contract.

c. A list of government furnished equipments required as part of the S-302()/TCC-62.

d. A list of equipments to be government loaned for testing purposes.

e. Submission of the statement referenced in 3.19.4 as soon as possible after award of contract. This statement should be submitted to the contracting officer.

6.3 Inspection.- Inspection is the examination or testing, or both, of supplies to determine compliance with applicable requirements. Sampling is an element of inspection.

6.3.1 Examination.- Examination consists of simple, generally nondestructive determinations of compliance, without use of special testing equipment.

6.3.2 Testing.- Testing consists of determinations of compliance, using technical means.

6.4 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 4.5.3.3)

6.5 Nomenclature.- The parenthesis in the nomenclature will be deleted or replaced by a letter identifying the particular design, for example: S-302M/TCC-62. The contractor should apply for nomenclature in accordance with the applicable clause in the contract.

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6.6 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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Project No 5805-A109

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