

MIL-S-49248B(CR)

12 February 1987

Superseding

MIL-S-49248A(CR)

10 FEB 84

MILITARY SPECIFICATION
SHELTER, ELECTRONIC EQUIPMENT
S-639/G AND S-640/G

This specification is approved for use by the Communications and Electronics Command, Department of the Army, and is available for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. - This specification covers the following:

1.1.1 Description. - Shelter, Electronic Equipment S-639/G is a mobile assemblage housed in a modified S-280()/G shelter equipped with work benches, storage cabinets and racks, lighting, air conditioning, and power to form an electronic repair shop for the maintenance of electronic equipment. It is capable of being transported by railroad, military truck and airlift.

1.1.2 Description. - Shelter, Electronic Equipment S-640/G is a mobile assemblage housed in a modified S-280()/G shelter equipped with storage cabinets and racks, lighting, exhaust blowers, and dehumidifier to form a storage shelter to support the repair shop assemblage. It is capable of being transported by railroad, military truck and airlift.

Beneficial comments (recommendations, additions, deletions) and pertinent data which may be of use in improving this document should be addressed to: Commander, U.S. Army Communications Electronics Command and Fort Monmouth, ATTN: AMSEL-ED-LM, Fort Monmouth, New Jersey 07703-5000 by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC:

FSC 5411

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2. APPLICABLE DOCUMENTS

2.1 Government documents

2.1.1 Specifications, standards and handbooks. - The following specifications, standards and handbooks form a part of this specification to the extent specified herein. Unless otherwise specified, the issues of these documents shall be those listed in the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitation.

SPECIFICATIONS

MILITARY

MIL-P-116	Preservation, Methods of
MIL-C-3885	Cable Assemblies and Cord Assemblies (for use in Electronic and associated Equipment)
MIL-W-6858	Welding, Resistance, Aluminum, Magnesium, Non-Hardening Steels or Alloys, Nickle Alloys, Heat Resisting Alloys, and Titanium Alloys, Spot and Seam
MIL-T-7928	Terminals, Lug and Splice, Crimp Style, Copper
MIL-W-8611	Welding, Metal Arc and Gas, Steels and Corrosion and Heat Resistant Alloys, Process for
MIL-M-13231	Marking of Electronic Items
MIL-F-14072	Finishes for Ground Electronic Equipment
MIL-W-45205	Welding, Gas Metal Arc and Gas, Tungsten-Arc, Aluminum Alloys
MIL-S-55507	Shelter, Electrical Equipment (with or without equipment) packaging of

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STANDARDS

MILITARY

MIL-STD-105	Sampling Procedures and Tables for Inspection of Attributes
MIL-STD-252	Wiring Equipment, Classification of Visual and Mechanical Defects
MIL-STD-454	Standard General Requirements for Electronic Equipment
MIL-STD-461	Electromagnetic Interference Characteristics, Requirements for Equipments
MIL-STD-462	Electromagnetic Interference Characteristics, Measurements of
MIL-STD-810	Environmental Test Methods

2.1.2 Other Government documents, drawings and publications. - The following other Government documents, drawings and publications form a part of this specification to the extent specified herein. Unless otherwise specified, the issues shall be those in effect on the date of the solicitation.

DRAWINGS

COMMUNICATIONS AND ELECTRONICS COMMAND

DL-B4029656	Shelter Electronic Equipment, S-639/G
DL-B4029831	Shelter Electronic Equipment, S-640/G
B4029747	Power Wiring Schematic S-639/G
B4029884	Power Wiring Schematic S-640/G

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

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2.2 Order of precedence. - In the event of a conflict between the text of this specification and the references cited herein (except for associated detail specification, specification sheets or MS standards), the text of this specification shall take precedence. Nothing in this specification, however, shall supersede applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 First Article. - When specified in the contract or purchase order, the contractor shall furnish a first article unit of the S-639/G and of the S-640/G in accordance with 4.3.

3.2 CONSTRUCTION. - (See 3.20)

3.2.1 Shelters. - Unless otherwise specified the Shelter, Electrical Equipment S-280()/G will be Government furnished.

3.2.2 Electronic shops installation. -

(a) Shelter, Electronic Equipment S-639/G shall be constructed in accordance with drawings listed on DL-B4029656, the requirements of this specification and any other requirements specified in the contract.

(b) Shelter, Electronic Equipment S-640/G shall be constructed in accordance with drawings listed on DL-B4029831, the requirements of this specification and any other requirements specified in the contract.

3.3 Electrical installation. - (See 4.6)

3.3.1 Power and signal system wiring and components. - The completed in-place power distribution system and signal wiring shall meet the following requirements:

3.3.1.1 Continuity of conductors. - The point-to-point resistance between each pin of the power and signal entrance connectors and respective circuit terminations shall be less than 1 ohm. (See 4.6.1.1, 4.6.2.1, 4.6.3 and 4.6.4).

3.3.1.2 Dielectric breakdown and insulation resistance. - All power and signal wires, cables and components shall withstand without flashover or insulation breakdown, a potential of 500 volts DC between each of the ungrounded power line conductors and shelter facility ground applied continuously for not less than thirty (30) seconds and the insulation resistance shall not be less than 100 megohms when tested in accordance with 4.6.1.2, 4.6.1.3, 4.6.2.2, 4.6.2.3, 4.6.3 and 4.6.4.

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3.3.2 Power distribution and operational functions. - Main power, branch distribution and circuit switching functions thereof shall meet the operational requirements of Power Schematic Diagrams B4029747 and B4029884 when tested in accordance with 4.6.1.4 and 4.6.2.4.

3.3.3 Cable assemblies, power and audio frequency. - All power and audio frequency cable and cord assemblies shall be fabricated in accordance with the specified drawings and meet the continuity, dielectric, insulation resistance and pull-out requirements of MIL-C-3885 (See 4.15).

3.4 Railroad transportation. - The shelter assemblage, with shelves loaded per 4.7.2, shall be capable of being loaded, blocked and braced on a flatcar for shipment by rail and shall be subjected to and withstand the tests of 4.7 without sustaining any permanent damage such as buckling, cracking, delamination or other permanent deformation.

3.5 Drop test. - The shelter assemblage, with shelves loaded per 4.7.2, shall be capable of withstanding drops of eighteen (18) inches onto concrete without sustaining any permanent damage such as buckling, cracking, delamination or other permanent deformation (See 4.8).

3.6 Air tightness test. - The shelter facility shall show no evidence of air leakage through seams, joints, rivets, etc, or modified exterior surfaces when tested for tightness in accordance with 4.9.

3.7 Mounting inserts. - All mounting inserts, unless otherwise specified, 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 4.10. There shall be no damage of permanent distortion to the shelter mounting surface or insert head and threads and the inserts shall not have rotated from their original position. Insert threads shall be free of paint.

3.8 Interference suppression. - The motors in the blowers, air conditioners and heaters, the fluorescent lighting and the power supplies used in the Electronic shops shall meet the emanation limits of MIL-STD-461 for tactical equipment, if other than those items defined by the drawings (See 4.14).

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3.9 Cleaning. - After fabrication, parts shall be cleaned in accordance with good commercial practice or as specified in the applicable portions of 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 assembly of the units (See 3.20).

3.10 Finish. - The shelter facility shall be finished in accordance with MIL-F-14072 and the equipment drawings (see 3.20 and 4.4).

3.11 Marking. - (See 3.20 and 4.4)

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

3.11.2 Nameplates. - Shelter facility and assemblage shall be provided with a nameplate in accordance with the equipment drawings. Each nameplate shall be imprinted with a sequential serial number.

3.11.3 Aircraft loading data plate. - The shelter assemblage shall be provided with data plates in accordance with equipment drawings, imprinted with the dimensions which locate the center-of-gravity of the shelter facility and assemblage; and the bearing pressure on the bottom of the skids. The location of the centers-of-gravity shall be determined by the contractor using the first article/unit of production.

3.11.4 Interior and exterior marking. - All interior and exterior markings shall be as defined by the equipment drawings unless otherwise specified.

3.12 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. Rivets shall conform to requirement 12 of MIL-STD-454 (See 3.20 and 4.4).

3.13 Seal, water vapor. - All joints and edges of the framing for the exhaust blower, power entrance box and air-conditioners shall be sealed to provide a barrier against the entrance of water vapor 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 suitable to prevent collection and retention of moisture. All exterior mounting inserts, rivets, screws, and fasteners shall be coated by a one-part sealant Silastic 738, as made by Dow Corning, or equal, using the manufacturer recommended primer (See 3.20).

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3.14 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 (See 3.20).

3.15 Soldering. - (See 3.20).

3.15.1 Solder and flux. - Solder and flux shall be as defined by equipment drawings.

3.15.2 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 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.

3.15.3 Process. - There shall be no sharp points or rough surfaces resulting from insufficient heating. The solder shall feather out to a thin edge, indicating proper flowing and wetting actions, and shall not be crystallized, overheated, or underheated. The minimum necessary amount of flux and solder shall be used for electrical connection. 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 materials 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.

3.16 Tropicalization of material. - Canvas, webbing, wood, etc. shall be treated to be resistant to moisture and fungi as follows:

3.16.1 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.

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3.16.2 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.

3.16.3 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.

3.16.4 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 in case the drawings do not specify the treatment in detail (See 4.16).

3.17 Welding. - Welding joints shall be as defined by the drawings and shall be such that grinding on the finished weld will be unnecessary except where grinding is specified on the drawings. Inert-gas-shielded arc welding using helium, argon, or a mixture of the two shall be used for arc welding of aluminum. Welds shall conform to MIL-W-6858 CL.B, MIL-W-45205 CL.B OR MIL-W-8611 as applicable. All surfaces to be welded shall be cleaned in accordance with good commercial practice and shall be free of scale, paint, grease, and other foreign materials. Welds shall have thorough penetration and good fusion and shall be free of scabs, blisters, abnormal pock marks, cracks, voids, slag inclusions, and other harmful defects. 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 3.20 and 4.4).

3.18 Wiring and cabling. - (See 3.20 and 4.4). Wiring and cabling shall be in accordance with the drawings and shall be neat and sturdy.

3.18.1 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 connectors.

(b) To permit removal from rack of operational equipments, having wiring or cables to connectors at back of equipment, so that cable may be connected or disconnected.

(c) To facilitate field repair of broken or cut wires.

(d) To prevent chafing or breaking of wires due to repeated flexing of hinged parts.

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3.18.2 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 materials.

3.18.3 Splicing. - Wires in a continuous run between two terminals shall not be spliced during the wiring operation unless specifically indicated by the equipment drawings.

3.18.4 Solderless terminal lug connection. - 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 MIL-T-7928 (See 4.11).

3.18.5 Identification of wiring. - Wiring shall be identified by color coding and wire pair marking as indicated on the drawings.

3.18.6 Testing. - Power and signal wiring shall be subjected to and pass the tests described in 4.6.

3.19 Interchangeability. - Like units, assemblies, sub-assemblies, and replaceable parts shall be physically and functionally interchangeable without modification of such items or of the equipment (See 4.12). Individual items shall not be handpicked for fit or performance. Reliance shall not be placed on any unspecified dimension, rating, characteristics, etc.

3.20 Workmanship. - (See 4.13) The equipment shall be manufactured and assembled in accordance with the applicable portions of the following paragraphs:

3.2	Construction
3.3	Electrical installation
3.7	Mounting inserts
3.9	Cleaning
3.10	Finish
3.11	Marking
3.12	Riveting
3.13	Seal, water vapor
3.14	Securing of parts
3.15	Soldering
3.16	Tropicalization
3.17	Welding
3.18	Wiring and cabling

3.21 Systems Safety Engineering. - (See 4.13).

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3.21.1 Personnel Hazards. - Personnel hazards shall be kept to a minimum. The criteria of MIL-STD-454, Requirement 1, shall be applicable for tasks and efforts such as the selection of parts, the complete manufacturing and assembly process, and any product baseline configuration changes that may be implemented during the course of the contract. Verification that compliance with this requirement has been achieved shall be through a visual inspection (See 4.13).

3.21.2 Edge Rounding Exposed. - Exposed edges and corners shall be rounded sufficiently to minimize laceration/puncture hazards, the design goal being a minimum radius of 0.04 inch (1 mm) for edges and a minimum of 0.5 inch (12.7 mm) for corners.

3.21.3 Radioactive Materials. - Radioactive materials shall not be used (e.g. luminous dials/markings, electron tubes, surge arrestors and lenses).

3.21.4 Exposed Voltages. - All contacts, terminals and like devices having voltages between 70 and 500 volts rms or dc with respect to ground, shall be guarded for accidental contact by personnel if such points are exposed to contact during direct support or operator maintenance.

3.21.5 Continuity of Conductors. - The continuity of a grounded conductor shall not be dependent upon device connections, such as lampholders, receptacles, etc., where the removal of such devices would interrupt the continuity.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. - Unless otherwise specified in the contract or purchase order, the contractor is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract or purchase order, the contractor may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform any of the inspection set forth in the specification where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

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4.1.1 Responsibility for compliance. - All items must meet all requirements of section 3 and 5. The inspection set forth in this specification shall become a part of the contractor's overall inspection system or quality program. The absence of any inspection requirements in the specification shall not relieve the contractor of the responsibility of assuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling in quality conformance does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to acceptance of defective material.

4.1.2 Accommodation and Assistance. - The Government quality assurance Representative shall have the right to access any area of the contractor's or his subcontractor's premises where any part of the work is being performed. The Government quality assurance representative shall be afforded unrestricted opportunity to verify conformance of the product with specification requirements. The contractor shall make his inspection equipment available for use by Government quality assurance representative for verification purposes. The contractor's personnel shall be made available for operation of such inspection equipment as required. All facilities and services necessary for the placement operation and maintenance of these test requirements shall be provided by the contractor.

4.2 Classification of inspection. - Inspections shall be classified as follows:

- (a) First Article Inspection (See 4.3). Does not include packaging.
- (b) Inspections covered by subsidiary documents (See 4.4).
- (c) Quality conformance inspection of equipment before packaging (See 4.5).
- (d) Packaging inspection (See 4.17).

4.3 First Article. - The First Article inspection shall be performed by the contractor (See 3.1).

4.3.1 First Article Inspection. - This inspection shall consist of the inspections specified in subsidiary documents covering the items listed in paragraph 4.4 and the inspections specified for group A, group B and group C (see Tables II, III, IV, respectively). The inspections shall be performed in the order shown in Table I.

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TABLE I

First Article Inspection

<u>Inspection</u>	<u>Requirement Paragraph</u>	<u>Test Paragraph</u>
Tropicalizaion of material*	3.16	4.16
Interchangeability	3.19	4.12
Solderless-terminal-lug connections	3.18.4	4.11
Mounting Inserts	3.7	4.10
Subsidiary documents	3.10, 3.11, 3.12, 3.17, 3.18	4.4
Visual and mechanical	3.20	4.13
Electrical installation	3.3	4.6
Railroad transportation	3.4	4.7
Drops, flat and rotational	3.5	4.8
Air tightness	3.6	4.9
Interference suppression*	3.8	4.14
Visual and mechanical (Repeat)	3.20	4.13
Electrical installation (Repeat)	3.3	4.6

Inspection marked (*) required only when materials or processes other than those defined by the drawings are used.

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>
Finish	3.10
Marking	3.11
Riveting	3.12
Welds	3.17
Wiring and cabling	3.18

4.5 Quality conformance inspection of equipment before packaging. - The contractor shall perform the inspection specified in 4.4 and 4.5. 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 as an element of government verification (See 4.1.1).

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4.5.1 Group A inspection. - Each unit on contract shall be inspected for conformance to the inspections specified in Table II. Lots shall be formed only from units that pass this inspection. Factors of lot composition not defined herein, or in the contract shall be in accordance with MIL-STD-105. Each lot may be subjected to a verification audit, utilizing the procedures of MIL-STD-105, using the general inspection levels of Table I of MIL-STD-105 and the AQLs indicated in Table II below.

TABLE II
GROUP A INSPECTIONS

INSPECTION	REQT PARA	INSP PARA	AQL%
Visual & Mechanical	3.20	4.13	Major Defect 1.5 Minor Defect 6.5
Electrical Installation	3.3	4.6	No failures Allowed
Airtightness	3.6	4.9	4.0

4.5.1.1 Order of inspection with Group A. - Group A inspection shall be performed in the order listed in Table II.

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4.5.2 Group B inspection. - This inspection shall conform to Table III and to the special inspection level S-4 of Table I of MIL-STD-105. Group B inspection shall be performed on units that have passed Group A inspection.

TABLE III
GROUP B INSPECTION

INSPECTION	REQT PARA	INSP PARA	AQL%
Mounting inserts	3.7	4.10	4.0
Interchangeability	3.19	4.12	4.0

4.5.2.1 Order of inspection within Group B. - Group B Inspection shall be performed in the order listed in Table III.

4.5.3 Group C Inspection. - Group C inspection shall be performed on units that have passed Group A and Group B inspection. The inspection shall consist of the inspections specified in Table IV. Samples shall be selected in accordance with 4.5.3.1 thru 4.5.3.2. Group A inspection shall be repeated after completion of Group C inspection.

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TABLE IV
GROUP C INSPECTION

INSPECTION	REQUIREMENT PARAGRAPH	INSPECTION PARAGRAPH
Mounting inserts	3.7	4.10
Solderless-terminal lug connections	3.18.4	4.11
Tropicalization of Material*	3.16	4.16
Interference Suppression*	3.8	4.14
Railroad transportation	3.4	4.7
Drops, flat and rotational	3.5	4.8

Inspection marked (*) required only when materials or processes other than those defined by the drawings are used.

4.5.3.1 Sampling for inspection of solderless-terminal-lug-connections. - Five specimens of each combination of wire and terminal produced each month shall be prepared for inspection. A specimen is a one 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.

4.5.3.2 Sampling for other Group C Inspection. - For inspection tests listed below, except railroad transportation, one unit shall be randomly selected from the first fifty (50) units (or fraction thereof) produced. Thereafter, one sample from each additional 150 units, or fraction thereof, produced shall be subjected to the tests below. Selection of the units to be tested shall be made by the government. Since inspection of the mounting inserts needs to be performed prior to the completion of the unit, unit selected for mounting insert inspection shall, whenever possible, be different from the unit selected for other inspections.

- a. Mounting Inserts
- b. Tropicalization of material
- c. Interference suppression
- d. Railroad transportation
- e. Drops: flat and rotational

4.5.3.3 Order of inspection: Group C inspection shall be performed in the order listed in Table IV.

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4.5.3.4 Non-Compliance. - All quality conformance inspections shall be halted, including Group A and Group B inspections, upon occurrence of any Group C failure. The contractor shall immediately report to the government 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 the processes and materials, as applicable on all units of production which are manufactured under the same conditions and which may be subject to the same failure. Reports shall be forwarded to the Government Procurement Quality Representative and to the responsible technical activity designated in the contract.

4.5.3.5 Reinspection of conforming Group C Sample units. - After corrective action has been taken, the failed unit and/or additional sample units shall be subjected to Group C inspection (all inspections, or the inspections which the sample failed, at the option of the technical activity). Any or all Group A inspections may also be reinstituted. All damage resulting from any testing shall be repaired. Final acceptance and shipment will be withheld until the reinspection results have shown that the corrective action was effective and approved by the technical activity.

4.6 Electrical installation tests. - (See 3.3). The tests of 4.6 as applicable shall be performed on each shelter facility. Before applying power to the shelter facility, an electrical ground at the power entrance box shall be established. Power to be supplied shall be 120/208 volts A.C., 3 phase, 60 hz.

4.6.1 Power system wiring and components installation tests (S-639/G). - Prior to conducting the tests of 4.6.1.1 thru 4.6.1.3 below, the following shall be accomplished:

(a) Remove or disconnect the following loads:

(1) All fluorescent, incandescent, and neon (power indicator, power distribution indicator, and correct-incorrect phase indicator) lamps.

(2) All fluorescent lamp starters.

(3) Heaters, D.C. power supply, frequency converter and air conditioners.

(4) Power surge arresters (Disconnect ground wires from ground stud).

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(b) Remove power distribution box cover panel and disconnect both conductors from the voltmeter and frequency meter terminals. Position or isolate disconnected leads so as not to short to each other or to shelter facility ground.

4.6.1.1 Continuity of conductors. - Continuity resistance tests shall be performed on each power circuit in accordance with the following paragraphs. Continuity shall exist between each pin of the power entrance connector and respective circuit termination and shall be less than 1 ohm. A calibrated low resistance reading ohmmeter or equivalent shall be used in performing the test.

(a) Place the following controls in the ON position.

- (1) Fluorescent light switches.
- (2) Incandescent cold start switch.
- (3) Blower switches.
- (4) All circuit breakers.
- (5) All DC switches for binding posts.

(b) Place the Blackout Bypass switch in the Bypass position.

(c) Measure continuity resistance as follows:

FROM

TO

Pin A of Power Input Connector
at the power entrance box

Black wire termination at air
conditioners 1 and 2

Black wire termination at the
frequency converter power receptacle

Black wire termination at fluorescent
and incandescent lamps

Black wire termination of D.C. power
supply receptacle

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Pin B of Power Input
Connector

Red wire termination at air
conditioners 1 and 2

Red wire termination at the frequency
converter power receptacle

Red wire termination (brass contact)
of the outside convenience receptacle
at the power entrance box and all 60
Hz convenience receptacles on
roadside and curbside walls.

Red wire termination (brass contact)
of all roadside and curbside bench
receptacles.

Red wire termination (brass contact)
of heater No. 1 power receptacle

Pin C of Power Input
Connector

Blue wire termination at air
conditioners 1 and 2

Blue wire termination at the
frequency converter power
receptacle

Blue wire termination (brass
contact) of each blower receptacle.

Blue wire termination (brass
contact) of heater No. 2 power
receptacle.

Pin N of Power Input
Connector

White wire terminations at each
fluorescent and incandescent lamp
air conditions 1 and 2, D.C. power
supply, frequency converter, all
convenience and bench receptacles
and blower 1 and 2 receptacles.

Pin G of Power Input
Connector

Ground terminal E1 and ground
contact of all electrical outlets,
60 Hz and 400 Hz.

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Black wire termination
of 400 Hz circuit breaker
(CB-12)

Black wire termination at each 208V,
3 phase, 400 Hz power receptacle.

Black wire termination at J-33 and
J-36, 120V, 1 phase, 400 Hz power
receptacles

Red wire termination
of 400 Hz circuit breaker
(CB-12)

Red wire termination at each 208V,
3 phase, 400 Hz power receptacle.

Red wire terminations at J-31 and
J-34, 120V, 1 phase, 400 Hz power
receptacles.

Blue wire termination
of 400 Hz circuit breaker
(CB-12)

Blue wire termination at each 208V
3 phase, 400 Hz power receptacle

Blue wire termination at J-32 and
J-35, 120V, 1 phase, 400 Hz power
receptacles.

White wire termination
of 400 Hz circuit breaker
(CB-12)

White wire termination at all 400 Hz
power receptacles

Positive terminal
of D. C. supply

Each positive binding post

Negative terminal of
D. C. supply

Each negative binding post

(d) No continuity shall exist between the following:

(1) Each pin of power entrance connector and each of the remaining
pins

(2) Each termination at the 400 Hz circuit breaker CB-12 and each
of the remaining terminations.

(3) Positive and negative D. C. binding posts

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4.6.1.2 Dielectric Strength of insulation. - Dielectric Strength Tests shall be performed on each power line circuit in accordance with the following paragraphs. The insulation of all power wires, cables and components shall withstand, without flashover or insulation breakdown, a potential of 500 volts D.C. applied continuously for not less than 30 seconds.

NOTE: Take preventive measures that will preclude personnel from coming into contact with circuits under test during performance of all dielectric strength and insulation resistance tests. Discharge each conductor to ground following each test in order to eliminate danger of electric shock.

(a) Retain all circuit controls tested under 4.6.1 above in the ON position except fluorescent lamp switches.

(b) Disconnect at the meter switch all lines to the phase indicator circuitry. Isolate the disconnected lines so as not to short to each other or to shelter facility ground.

(c) Test between pin A of the power input connector and all other pins of the power input connector strapped to shelter facility ground. Adjust tester for an output of 500 volts D.C. and maintain this potential for 30 seconds.

(d) Repeat step c above for the following test points.

(1) Pin B of the power input connector with all other pins for the power input connector strapped to shelter facility ground.

(2) Pin C of the power input connector with all other pins of the power input connector strapped to shelter facility ground.

(3) Pin N of the power input connector with all other pins of the power input connector strapped to shelter facility ground.

(4) Black wire termination at the 400 Hz circuit breaker (CB-12) with all other terminations at CB-12 strapped to shelter facility ground.

(5) Red wire termination at CB-12 with all other terminations at CB-12 strapped to shelter facility ground.

(6) Blue wire termination at CB-12 with all other terminations at CB-12 strapped to shelter facility ground.

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(7) White wire termination at CB-12 with all other terminations at CB-12 strapped to shelter facility ground.

4.6.1.3 Insulation resistance. - Insulation resistance tests shall be made on each power line conductor. Test conditions, preparatory and points of measurements shall be as given in 4.6.1.2 above. The insulation resistance of all conductors with respect to ground shall not be less than 100 megohms.

4.6.1.4 Power distribution and operational functions. - Subsequent to the tests of 4.6.1.1 thru 4.6.1.3, power distribution and operational functions tests per 4.6.1.4.1 shall be made with all electrical sources and loads connected. Prior to conducting these tests, the following shall be accomplished.

- (1) Place all circuit breakers in the OFF position.
- (2) Place all lighting controls and blower switches in the OFF position.
- (3) Place Blackout Bypass switch in the Bypass position.
- (4) Replace all fluorescent, incandescent and neon lamps and fluorescent lamp starters.
- (5) Reconnect voltmeter, frequency meter and phase indicator circuitry and secure power distribution box cover panel.
- (6) Reconnect, if provided, D.C. power supply, frequency converter and air conditioners and blowers and open exhaust port covers on the blowers.
- (7) Provide suitable 120 VAC test lamps or equivalent test indicators for the 120 VAC power receptacles.
- (8) Apply 120/280V, 3 phase, 60 hertz power to power input connector at the power entrance box. Power ON indicator lamps shall light. Correct phase indicator lamp shall light.
- (9) Rotate meter switch to position L1, L2, and L3 respectively. The voltmeters shall indicate specific voltage (approximately 120 volts) in each instance. The frequency meter shall indicate 60 hertz in each instance.
- (10) Place main circuit breaker in the ON position.

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4.6.1.4.1 Power operational tests. -

a. Bench receptacles (CB-1)

(1) Place CB-1 in the ON position. Neon lamp above CB-1 shall light and test lamp placed in each roadside and curbside bench receptacle shall light.

(2) Place CB-1 in the OFF position. Neon lamp above CB-1 shall go out and test lamp in each bench receptacle shall go out.

b. Blowers (CB-2)

(1) Place CB-2 in the ON position, neon lamp above CB-2 shall light.

(2) Place blower No. 1 switch in the ON position, blower, if provided, shall operate and shall exhaust air from the shelter.

(3) Place blower No. 1 switch in the OFF position, blower shall cease operating.

(4) Repeat steps (2) and (3) above for blower No. 2, if blower No. 2 is provided.

(5) Place CB-2 in the OFF position, neon lamp above CB-2 shall go out.

c. D.C. Power Supply, if provided (CB-3)

(1) Place CB-3 in the ON position, neon lamp above CB-3 shall light.

(2) Perform turn on procedures for the D.C. power supply in accordance with its operator's manual.

(3) Place D.C. circuit breakers CB-13 thru CB-16 in the ON position and check for nominal 28 VDC between each pair of binding posts using a calibrated DC voltmeter.

(4) Place DC circuit breakers CB-13 thru CB-16 in the OFF position and check for 0 volts between each pair of DC binding posts.

(5) Turn DC power supply OFF, place CB-3 in the OFF position, neon lamp above CB-3 shall go out.

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d. Heater No. 1 (CB-4).

(1) Place CB-4 in the ON position, neon lamp above CB-4 shall light test lamps in both heater No. 1 receptacles shall light.

(2) Place CB-4 in the OFF position, neon lamp and test lamps mentioned above shall go out.

e. Heater No. 2 (CB-5).

(1) Place CB-5 in the ON position, neon lamp above CB-5 shall light test lamp in heater No. 2 receptacle shall light.

(2) Place CB-5 in the OFF position, neon lamp and test lamp mentioned above shall go out.

f. Lighting circuit (CB-6)

(1) Place circuit breaker CB-6 in the ON position, neon lamp above CB-6 shall light.

(2) Place fluorescent lamp switches in the ON position. All fluorescent lamps shall light.

(3) Place incandescent lamp switch in the ON position. All incandescent lamps shall light.

(4) Place CB-6 in the OFF position, all fluorescent, incandescent and neon lamps mentioned in steps 1 thru 3 above shall go out.

(5) Place CB-6 in the ON position in restore lights.

(6) With shelter door open, place blackout bypass switch in the Blackout position. All fluorescent and incandescent lamps shall go out.

(7) Close shelter door. All fluorescent and incandescent lamps shall light.

(8) Place fluorescent lamp switches in the OFF position. All fluorescent lamps shall go out.

(9) Place incandescent lamp switch in the OFF position. All incandescent lamps shall go out.

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(10) Open shelter door and restore lights by placing blackout bypass switch in the bypass position and fluorescent lamp switches in the ON position.

g. Convenience outlets (CB-7 and CB-17).

(1) Place CB-7 in the ON position, neon lamp above CB-7 shall light, test lamps in all convenience outlets (except outside convenience) shall light.

(2) Place CB-7 in the OFF position, neon lamps and test lamps mentioned above shall go out.

(3) Place CB-17 in the Power Entrance Box in the ON position. Test lamp in the outside convenience outlet shall light.

(4) Place CB-17 in the OFF position. Test lamp in the outside convenience outlet shall go out.

h. Air conditioner No. 1, if provided (CB-8).

(1) Place CB-8 in the ON position, neon lamp above CB-8 shall light.

(2) Perform turn on procedures for air conditioner in accordance with its operator's manual. The air conditioner shall function properly.

(3) Turn air conditioner off, place CB-8 in the OFF position, neon lamp above CB-8 shall go out.

i. Air conditioners No. 2, if provided (CB-9)

(1) Repeat paragraph h above for air conditioner No. 2 and circuit breaker CB-9.

j. Frequency converter (CB-10).

(1) Place CB-10 in the ON position, neon lamp above CB-10 shall light.

(2) Perform turn on procedures for the frequency converter in accordance with its operator's manual. The frequency converter shall function properly. Use test lamp if frequency converter is not available.

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(3) Turn OFF frequency converter and place CB-10 in the OFF position, neon lamp above CB-10 shall go out.

k. Main circuit breaker

(1) Plug all operational and test equipments (including heaters) to be furnished with the facility into an appropriate electrical outlet and place all circuit breakers in the ON position.

(2) Perform turn on procedures for all equipments in accordance with their operator's manuals.

(3) With all equipments operating place main circuit breaker in the OFF position. All equipments shall cease operating and all lights, except power ON indicator lamps shall go out.

(4) Replace all circuit breakers and switches to the OFF position except fluorescent light switches. Restore lights by placing main circuit breaker to the ON position.

4.6.2. Power system wiring and components installation tests (S-640/G). - Prior to conducting the tests of 4.6.2.1 thru 4.6.2.3 below, the following shall be accomplished:

a. Remove or disconnect the following loads:

(1) All fluorescent, incandescent and neon (power indicator, power distribution indicator, and correct-incorrect phase indicator) lamps.

(2) All fluorescent lamp starters.

(3) Heaters, blowers and dehumidifier.

(4) Power Surge Arresters (Disconnect ground wires from ground stud)

b. Remove power distribution box cover panel and disconnect both conductors from the voltmeter and frequency meter terminals. Position or isolate disconnected leads so as not to short to each other or to shelter facility ground.

4.6.2.1 Continuity of conductors: Continuity resistance tests shall be performed on each power circuit in accordance with the following paragraphs. Continuity shall exist between each pin of the power entrance connector and respective circuit terminations and shall be less than 1 ohm. A calibrated low resistance reading ohmeter or equivalent shall be used in performing the test.

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a. Place the following controls in the ON position.

- (1) Fluorescent light switches.
- (2) Incandescent cold start switch.
- (3) All circuit breakers.
- (4) Blower switches.

b. Place Blackout Bypass switch in the Bypass position.

c. Measure continuity resistance as follows:

FROM	TO
Pin A of Power Input Connector at the Power Entrance Box	Black wire termination at each fluorescent and incandescent lamp.
	Black wire termination (brass contact) at outside convenience outlet.
	Black wire termination at air conditioners 1 and 2 receptacles
	Black wire termination (brass contact) of Dehumidifier receptacles
Pin B of Power Input Connector	Red wire termination (brass contact) at heater No. 1 receptacles
	Red wire termination at air conditioners 1 and 2 receptacles
	Red wire termination (brass contact) at each convenience outlet
Pin C of Power Input Connector	Blue wire termination (brass contact) of heater No. 2 receptacles

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	Blue wire termination (brass contact) at each blower receptacle
	Blue wire termination at air conditioners 1 and 2 receptacles
Pin N of Power Input Connector	White wire termination at each fluorescent lamp and incandescent lamp
	White wire termination at all electrical outlets
Pin G of Power Input Connector	Ground terminal E1 and ground contact of all electrical outlets

d. No continuity shall exist between each pin of the power input connector and each of the remaining pins.

4.6.2.2 Dielectric strength of insulation. - Dielectric strength tests shall be performed on each power line circuit in accordance with the following paragraphs. The insulation of all power wires, cables and components shall withstand, without flashover or insulation breakdown, a potential of 500 volts D.C. applied continuously for not less than 30 seconds.

NOTE: Take preventive measures that will preclude personnel from coming into contact with circuits under test during performance of all dielectric strength and insulation resistance tests. Discharge each conductor to ground following each test in order to eliminate danger of electric shock.

a. Retain all circuit controls listed under 4.6.2 above in the ON position except fluorescent lamp switches.

b. Disconnect at the meter switch all lines to the phase indicator circuitry. Isolate the disconnected lines so as not to short to each other or to shelter facility ground.

c. Test between pin A of the power input connector and all other pins of the power input connector strapped to shelter facility ground. Adjust tester for an output of 500 volts DC and maintain this potential for 30 seconds.

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d. Repeat step c above for the following test points.

(1) Pin B of the power input connector with all other pins of the power input connector strapped to shelter facility ground.

(2) Pin C of the power input connector with all other pins of the power input connector strapped to shelter facility ground.

(3) Pin N of the power input connector with all other pins of the power input connector strapped to shelter facility ground.

4.6.2.3 Insulation resistance. - Insulation resistance tests shall be made on each power line conductor. Test conditions, preparations and points of measurement shall be as given in 4.6.2.2 above. The insulation resistance of any conductor with respect to ground shall not be less than 100 megohms.

4.6.2.4 Power distribution and operational functions. - Power distribution and operational function tests shall be made subsequent to the tests of 4.6.2.1 thru 4.6.2.3 above with all electrical sources and loads connected. Prior to conducting the tests of 4.6.2.4.1 below, the following shall be accomplished.

(1) Place all circuit breakers in the OFF position.

(2) Place all lighting controls in the OFF position.

(3) Place Blackout Bypass switch in the Bypass position.

(4) Place blower switches in the OFF position.

(5) Replace all fluorescent, incandescent and neon lamps and fluorescent lamp starters.

(6) Reconnect voltmeter, frequency meter and phase indicator circuitry and secure power distribution box cover panel.

(7) Reconnect, if provided, blowers and dehumidifier and open outer exhaust port covers of the blowers and drain plug of the dehumidifier.

(8) Provide suitable 120 VAC test lamps or equivalent test indicators for the 120 VAC power receptacles.

(9) Apply 120/280V 3 phase, 60 hertz power to power input connector at the power entrance box. Power ON indicator lamps shall light. Correct phase indicator lamp shall light.

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(10) Rotate meter switch to positions L1, L2 and L3 respectively. The voltmeter shall indicate specific line voltage (approximately 120 volts) in each instance. The frequency meter shall indicate 60 hertz in each instance.

(11) Place main circuit breaker in the ON position.

4.6.2.4.1 Power operational tests. -

a. Convenience outlets (CB-1 and CB-10)

(1) Place CB-1 in the ON position, neon lamp above CB-1 shall light and test lamps in all convenience outlets (except outside convenience) shall light.

(2) Place CB-1 in the OFF position, neon lamp and test lamps mentioned above shall go out.

(3) Place CB-10 in the Power Entrance Box in the ON position. Test lamp in the outside convenience outlet shall light.

(4) Place CB-10 in the OFF position. Test lamp in the outside convenience outlet shall go out.

b. Blowers (CB-2)

(1) Place CB-2 in the ON position, neon lamp above CB-2 shall light.

(2) Place blower No. 1 switch in the ON position, blower No. 1 if provided, shall operate and shall exhaust air from the shelter.

(3) Place blower No. 1 switch in the OFF position, blower No. 1 shall cease operating.

(4) Repeat steps 2 and 3 above for blower No. 2 if blower No. 2 is provided.

(5) Place CB-2 in the OFF position, neon lamp above CB-2 shall go out.

c. Dehumidifier (CB-3)

(1) Place CB-3 in the ON position, neon lamp above CB-3 shall light.

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(2) Perform turn on procedures for the dehumidifier in accordance with its operator's manual. The dehumidifier shall function properly.

(3) Turn OFF dehumidifier and place CB-3 in the OFF position, neon lamp above CB-3 shall go out.

d. Heater No. 1 (CB-4)

(1) Place CB-4 in the ON position, neon lamp above CB-4 shall light, and test lamps in heater No. 1 receptacles shall light.

(2) Place CB-4 in the OFF position, neon lamps and test lamps mentioned above shall go out.

e. Heater No. 2 (CB-5)

(1) Place CB-5 in the ON position, neon lamp above CB-5 shall light and test lamp in heater No. 2 receptacle shall light.

(2) Place CB-5 in the OFF position, neon lamp and test lamp mentioned above shall go out.

f. Lighting Circuit (CB-6)

(1) Place circuit breaker CB-6 in the ON position, neon lamp above CB-6 shall light.

(2) Place fluorescent lamp switches in the ON position. All fluorescent lamps shall light.

(3) Place incandescent lamp switch in the ON position. All incandescent lamps shall light.

(4) Place CB-6 in the OFF position. All fluorescent, incandescent and neon lamps mentioned in steps 1 thru 3 above shall go out.

(5) Place CB-6 in the ON position to restore lights.

(6) With shelter door open, place blackout bypass switch in the blackout position. all fluorescent and incandescent lamps shall go out.

(7) Close shelter door. All fluorescent and incandescent lamps shall light.

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(8) Place fluorescent lamp switches in the OFF position. All fluorescent lamps shall go out.

(9) Place incandescent lamp switch in the OFF position. All incandescent lamps shall go out.

(10) Open shelter door and restore lights by placing blackout bypass switch in the bypass position and fluorescent lamp switches in the ON position.

g. Spare (CB-7)

(1) Place CB-7 in the ON position, neon lamp above CB-7 shall light.

(2) Place CB-7 in the OFF position, neon lamp above CB-7 shall go out.

h. Air conditioner No. 1 if provided (CB-8)

(1) Place CB-8 in the ON position, neon lamp above CB-8 shall light.

(2) Perform turn on procedure for the air conditioner in accordance with its operator's manual. The air conditioner shall function properly.

(3) Turn air conditioner off, place CB-8 in the OFF position, neon lamp above CB-8 shall go out.

i. Air conditioners No. 2, if provided (CB-9)

Repeat paragraph h above for air conditioner No. 2 and circuit breaker CB-9.

j. Main circuit breaker

(1) Plug heaters into their appropriate receptacles and place all circuit breakers and switches in the ON position.

(2) With all shelter equipments operating place main circuit breaker in the OFF position. All equipments shall cease operating and all lights except power ON indicator lamps shall go out.

(3) Replace all circuit breakers and switches to the OFF position except fluorescent light switches. Restore lights by placing main circuit breaker in the ON position.

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4.6.3 Signal Wiring S-639/G. - Disconnect TA-312, LS-147, TA-341/838 and the ground wires for the signal line surge arresters for the following tests:

a. Continuity

Continuity shall exist between each binding post in the power entrance box and the corresponding signal wire termination in the shelter. Continuity resistance shall be less than 1 ohm.

b. Insulation resistance

Insulation resistance test shall be made on each signal conductor. Insulation resistance of each signal conductor with respect to ground shall not be less than 100 megohms. Measurement shall be made at each binding post.

c. Operations test:

(1) Connect two wires from TA-312/PT Telephone to binding posts 1a and 1b in the power entrance box.

(2) Connect tinned ends of telephone signal cord to the binding posts of the other TA-312/PT telephone.

(3) Operate ringer on each phone, in turn, and talk into each phone. Two way voice communication shall be possible.

4.6.4 Signal Wiring S-640/G. - Disconnect TA-312, LS-147, TA-341/838 and the ground wires for the signal line surge arresters for the following tests:

a. Continuity

(1) Continuity shall exist between the following and continuity resistance shall be less than 1 ohm.

(a) Each binding post in the power entrance box and the corresponding signal wire termination in the shelter.

(b) Between each pin of connectors J6 and J7 in the power entrance box and the corresponding pins of connectors P6 and P7 near the inside front of the shelter.

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(2) Measure continuity resistance for:

Two conductors for TA-312
 Two conductors for LS-147
 Four conductors for TA-341/838
 Four conductors of Cable Assy, Data (J7 to P7)
 Eight conductors of Cable Assy, Voice (J6 to P6)

b. Insulation resistance:

Insulation resistance test shall be made on each signal conductor. Insulation resistance of each signal conductor with respect to ground shall not be less than 100 megohms. Measurement shall be made at each binding post and at each conductor of connectors J6 and J7.

c. Operations Tests:

(1) Connect two wires from a TA-312/PT Telephone to binding posts 1a and 1b in the power entrance box.

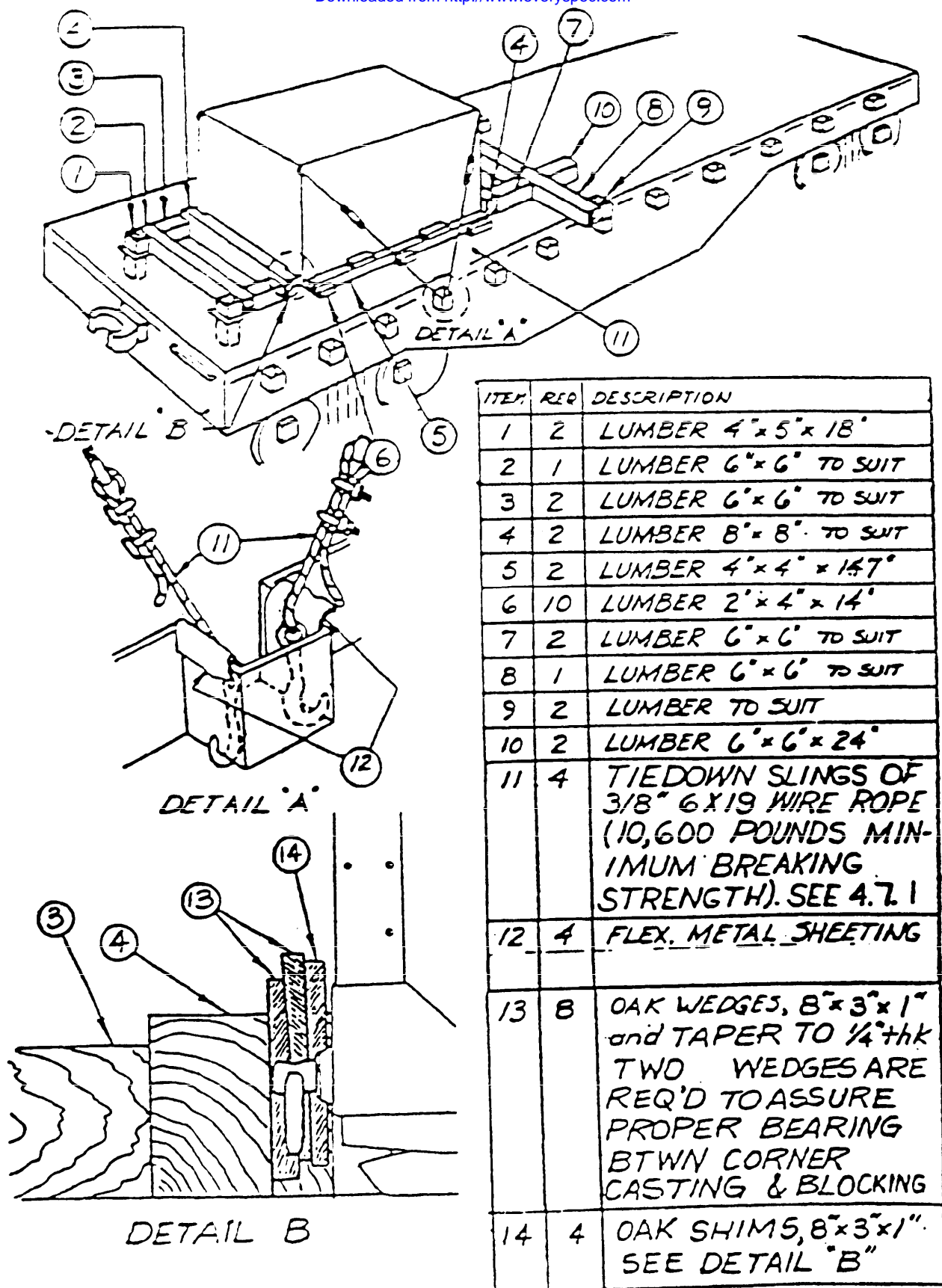
(2) Connect tinned ends of telephone signal cord to the binding posts of the other TA-312/PT Telephone.

(3) Operate ringer on each phone, in turn, and talk into each phone. Two way voice communication shall be possible.

4.7 Rail transport, impact test. - The shelter assemblage with shelves loaded per 4.7.2 secured to a flatcar shall be impacted by a loaded gondola car. The test shall be performed on a straight and level stretch of track. The test flatcar with its timber blocking and shelter tie down slings, shall be as specified in figure 1 and shall meet the provisions of the test as specified in 4.7.1. The test flatcar (less the shelter) and the two empty flatcars coupled to it shall each weigh between 45,000 and 55,000 pounds. The loaded gondola car shall meet the provisions specified in 4.7.3 and shall have a total weight of 165,000 pounds. The loaded gondola car totaling 165,000 pounds traveling at 9 miles per hour (or equivalent energy conditions acceptable to the Government Technical Representative) shall be impacted against the stationary loaded test car coupled to the empty flatcars with brakes off. The test shall consist of four impacts. The first two impacts shall be with the door end of the shelter facing the loaded gondola car; the second two impacts shall be with the door end of the shelter facing the opposite direction from the loaded gondola car. The lashing, blocking and wedges holding the shelter in place shall be tight at the start of each run. If the blocking is torn loose or the lashing is broken during impact, the run shall be repeated. After each impact the shelter assemblage shall meet the requirements of 3.4.

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4.7.1 Test flatcar. - The wooden planking of the test flatcar bed shall be in good condition. All 6 x 6 inch blocking shall be secured to the bed of the flat car using 10-inch spikes on 2-inch centers. The blocking along the door end and opposite end of the shelter shall fit tightly against the corner castings along the full length of the castings except as necessary to clear the towing shackles. This shall be accomplished by means of power sawed notches. The blocking along the other two sides of the shelter shall fit tightly against the corner castings, along the full length of the castings. These four blocking members shall be notched or shimmed to contact the trim along the sides of the shelter. The 4 x 4 inch blocking shall be nailed to the bed of the flatcar as shown in figure 1. All other blocking shall be firmly secured as shown in figure 1. Lashing shall consist of four wire rope slings, each including a 3/8 inch diameter, 6 x 19, flexible steel, preformed wire rope (having a breaking strength of 10,600 pounds minimum), a turnbuckle, two hooks, with thimbles and fasteners as required; the breaking strength of the sling shall be 9,000 pounds minimum. Before each impact, each sling shall be taut (600-800 pounds tension).



SHELTER SECURED ON FLATCAR

FIGURE 1

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4.7.2 Shelter shelves shall be loaded with uniformly distributed dummy loads strapped to the shelves, centrally located, covering at least 50 percent of the shelf area. Shelf loading shall be as follows:

a. S-639:

100 lbs each on each of the four shelves.

b. S-640:

(1) Shelves of roadside rack starting from the bottom shelf: 180 lbs, 160 lbs, 100 lbs, 40 lbs and 20 lbs.

(2) Shelves of curbside front rack starting from the shelf above the dehumidifier: 180 lbs, 100 lbs, 70 lbs and 30 lbs.

(3) Shelves of curbside rear racks starting from the bottom shelf: 180 lbs, 60 lbs, 50 lbs and 20 lbs.

4.7.3 Loaded gondola car. - The load in the loaded gondola car shall be of the following:

a. A coarse size of either coal, crushed stone, gravel, concrete or metal scrape (other than sheet metal, metal shavings or other springy forms of metal).

b. Chunk, slab, block or plate forms of the preceding acceptable materials, constrained to prevent shifting.

4.8 Drop tests. -

4.8.1 Flat drop. - The shelter assemblage shall be lifted 18 inches from the ground and allowed to fall freely with the skids impacting onto a hard substantial concrete surface. The test shall be performed once. Upon completion of this drop, the assemblage shall meet the requirements of 3.5.

4.8.2 Rotational Drop. - The shelter assemblage 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 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. On completion of these drops, the shelter assemblage shall meet the requirements of 3.5.

4.9 Air tightness test. - The shelter facility when subjected to the following test, shall meet the requirements 3.6.

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a. The air tightness shall be tested by introducing clean dry air into the closed shelter through an existing appropriate opening (i.e. drain fixture) to create an internal air pressure that exceeds the external pressure by a minimum of six (6) inches of water.

b. A manometer graduated in 0.1 inches or less shall be utilized to measure this differential pressure.

c. The test apparatus shall include an air supply sufficient to maintain the required air pressure, an air flow regulator and an input air pressure gage.

d. The shelter facility shall be tested for air tightness by painting the sealed joints, seams, rivets, etc. of the external modifications with Leak-Tac Formula 372 (American Gas & Chemicals, Inc., Leak-Tac Division) or equal soap and water solution.

e. To minimize air loss, temporary seals, shims and tape are permitted to seal the shelter door, blower cover and air-conditioner port openings not being tested.

4.10 Mounting insert tests. - Four of each size inserts shall be randomly selected for test. Each insert shall be tested with an axial load followed by a torque load in accordance with Table V. After test, the requirements of 3.7 shall be met. Failure of any insert shall be cause for rejection of the sample equipment. This test shall be conducted prior to installation of brackets, racks, etc.

TABLE V

Mounting insert loads

Insert Size	First Article and Group C Test		Group B Test	
	Axial (lbs)	Torque (Inch lbs)	Axial (lbs)	Torque (Inch lbs)
10-32	600	23	300	23
1/4-20	1300	60	650	60
5/16-18	2000	100	1000	100

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4.11 Testing of solderless terminal-lug connections. - Connections made with solderless terminal-lugs shall be tested for conformance to 3.18.4.

4.12 Inspection for interchangeability. - The dimensions listed below shall be gauged or measured to determine compliance with the physical interchangeability requirements of 3.19. 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.

4.13 Visual and mechanical inspection. - The shelter assemblage shall be examined for the defects listed in MIL-STD-252, the requirements of 3.20 and TABLE VI. An inspection shall also be performed to verify compliance with those portions of 3.21 (Systems Safety Engineering) which can be determined visually.

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TABLE VI

Classification of Visual and Mechanical Defects

<u>Classification</u>	<u>Defects</u>
Major	<ol style="list-style-type: none"> 1. Mounting plates missing or mislocated. 2. Aircraft loading data plate, instruction or nameplate omitted, incorrect or illegible. 3. Welds-cracked or porous. Inspection of welded assemblies, such as equipment racks entrance boxes, etc. should be made prior to final paint application. 4. Sealer improperly applied (holes, separations, or lack of adhesion). 5. Mounting inserts missing or mislocated. 6. Burrs or sharp edges in wire duct not removed. 7. Equipments or bracketry loose or missing. 8. Doors, etc. inoperative. 9. Electrical receptacles, switches, jacks, connectors, wire ducts, or other electrical components loose, improperly located or inoperative. 10. Locking or holding devices missing or inoperative. 11. Gaps between sections of wire duct exceed 1/16 inch. 12. The blower housing or air conditioner mount does not align properly with the mounting inserts of the shelter facility. 13. Ground stud not properly sealed. 14. Bulkhead power and signal connector fasteners not sufficiently tight. 15. Electrical schematics missing.
Minor	<ol style="list-style-type: none"> 1. Doors not easily operable. 2. Fastening devices difficult to operate. 3. Finish-abrasions or scratches. 4. Burrs and sharp edges on brackets not removed. 5. Screws loose. 6. Gaskets, not completely and securely adhered. 7. Electrical schematics not properly adhered to wall. 8. Cable assemblies not dressed properly.

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4.14 Electromagnetic interference test. - The items stated in 3.8 shall be determined to comply with the requirements of 3.8. Test methods and procedures shall be in accordance with MIL-STD-462, Notice 3, as implemented by a contractor prepared, Government approved, EMI Test Plan.

4.15 Cable Assemblies, power and audio frequency. - Each cable assembly shall be tested for continuity, dielectric, insulation resistance and pull-out per MIL-C-3885 (See 3.3.3).

4.16 Tropicalization of materials. - All materials of construction shall be in accordance with the equipment drawings and shall be Fungus-inert. Substitution of any materials other than specified must be approved by the contracting officer. The material will only be approved after the contractor tests the material for Fungus-Resistance satisfactorily in accordance with requirement 508.1 of MIL-STD-810c.

4.17 Packaging inspection. - Packaging inspection requirements specified herein are classified as follows:

- a. First Article Inspection of Packaging
- b. Quality Conformance Inspection of Packaging.

4.17.1 First Article Inspection of Packaging. - Unless otherwise specified in the contract, First Article Inspection of Packaging shall be in accordance with the Unit Pack Design Validation Requirements of MIL-P-116.

4.17.2 Quality Conformance Inspection of Packaging.

4.17.2.1 Preservation inspection. - Inspection of preservation and interior markings shall be in accordance with group A and B Quality Conformance Inspection Requirements of MIL-P-116. Lot formation and sampling procedures shall be as specified therein.

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

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TABLE VII PACKING INSPECTION PROVISIONS

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

5. PACKAGING.

5.1 Packaging requirements. - The requirements for packaging shall be in accordance with MIL-S-55507.

6. NOTES:

6.1 Intended use. - Electronic shops are used to provide backup maintenance support for electronic equipment components. Specific use is as follows:

a. Shelter, Electronic Equipment S-639/G is used as the repair or maintenance shop for accomplishing the maintenance functions.

b. Shelter, Electronic Equipment S-640/G is used as the storage facility for the repair parts and electronic equipment major components maintenance float.

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

- a. Title, number and date of this specification and any amendments thereto and the shop type (S-639/G or S-640/G) required.
- b. First article and Group C inspection of the Shelter assemblage requires use of contractor fabricated dummy loads or Government furnished live loads (operational equipment) as specified in the bid request and contract.
- c. A list of Government furnished equipments required as part of the S-639/G and S-640/G.
- d. A list of equipments to be Government loaned for testing purposes.
- e. Level A or B preservation and packing (see section 5).
- f. When first article inspection rough handling tests are not required.
- g. When first article packaging inspection test reports require Acquisition Activity approval prior to production unit packing.

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

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

6.5 Subject Term (Keyword) Listing. -

Assemblage, mobile
Maintenance, electronic equipment
Repair shop, electronic
Shelter, electronic equipment
Storage
S-639/G
S-640/G

Custodian:

ARMY-CR

Preparing Activity

ARMY-CR

Project No. 5411-A033

U.S. GOVERNMENT PRINTING OFFICE: 1987-704-036/70628

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

(See Instructions - Reverse Side)

1. DOCUMENT NUMBER

MIL-5-49248B

2. DOCUMENT TITLE

3a. NAME OF SUBMITTING ORGANIZATION

4. TYPE OF ORGANIZATION (Mark one)

☐

VENDOR

☐

USER

☐

MANUFACTURER

☐

OTHER (Specify) _____

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

5. PROBLEM AREAS

a. Paragraph Number and Wording:

b. Recommended Wording:

c. Reason/Rationale for Recommendation:

6. REMARKS

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

b. WORK TELEPHONE NUMBER (Include Area Code) - Optional

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

8. DATE OF SUBMISSION (YYMMDD)

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