TECHNICAL MANUAL

ORGANIZATIONAL MAINTENANCE MANUAL

MOTOR-GENERATORS

PU-543/A (MODIFIED) (NSN 6125-00-062-7483),

PU-543A/A (MODIFIED) (NSN 6125-00-884-5261),

PU-543B/A (NSN 6125-00-863-9683),

PU-543C/A (NSN 6125-00-938-6539),

AND

PU-543D/A (NSN 6125-00-938-6539)

HEADQUARTERS, DEPARTMENT OF THE ARMY
OCTOBER 1977

WARNING

Dangerous voltages exist in this equipment. Always de-energize the motor-generator before working with the ac output circuits. Serious INJURY or DEATH may result from contact with these points when energized.

If the PU-543(*)/As are located in the nose of a helicopter, adjustment of the VOLTAGE control must be made with the aircraft engine inoperative and an auxiliary power unit (apu) connected as the source of aircraft power. Should an apu not be available and the aircraft engine required to be operating for power, access to the PU-543( )/As must be made through the nose compartment access door to keep the person making adjustment clear of the aircraft flight controls.

All maintenance and maintenance facilities must conform to TB 385-4, Safety Precautions for Maintenance of Electrical/Electronic Equipment.

Cleaning solvents may be flammable and toxic. Use only in well ventilated areas. Avoid inhalation of vapor and skin contact. Do not use solvents near open flame or in areas where very high temperatures prevail.

DON’T TAKE CHANCES!

DEPARTMENT OF THE ARMY TECHNICAL MANUAL

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Headquarters, Department of the Army, Washington, D.C.
12 October 1977

Current as of May 1977

REPORTING OF ERRORS

You can help improve this manual by calling attention to errors and by recommending improvements and stating your reasons for the recommendations. Your letter or DA Form 2028 (Recommended Changes to Publications and Blank Forms), should be mailed directly to the Commander, US Army Electronics Command, Attn: DRSEL-MA-Q, Fort Monmouth, N J 07703. A reply will be furnished directly to you.

*This manual supersedes TM 11-6125-220-12, 18 July 1962, Including all changes.

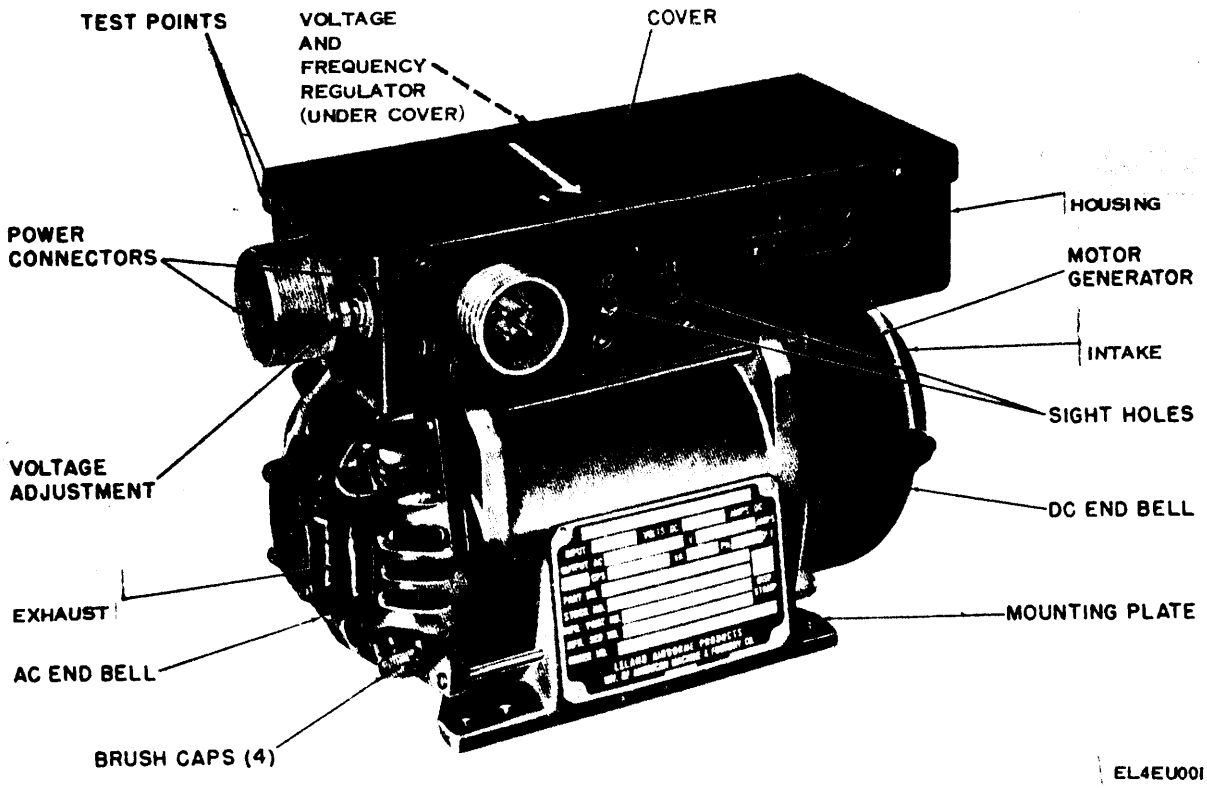

Figure 1-1. Motor-Generators PU-543/A (modified), P/U-543A/A (modified), and PU-543C/A.

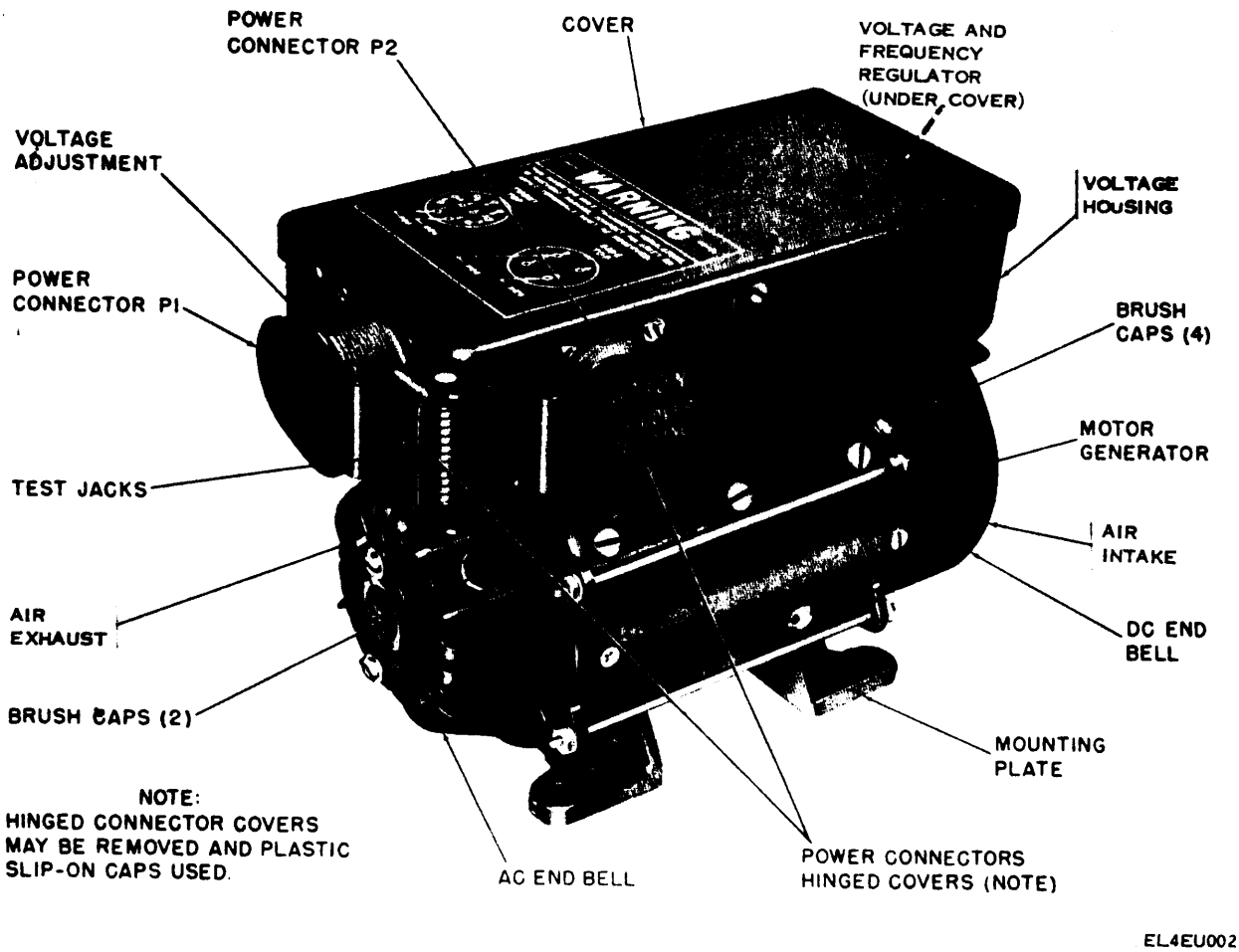

Figure 1-2. Motor-Generator PU-543B/A.

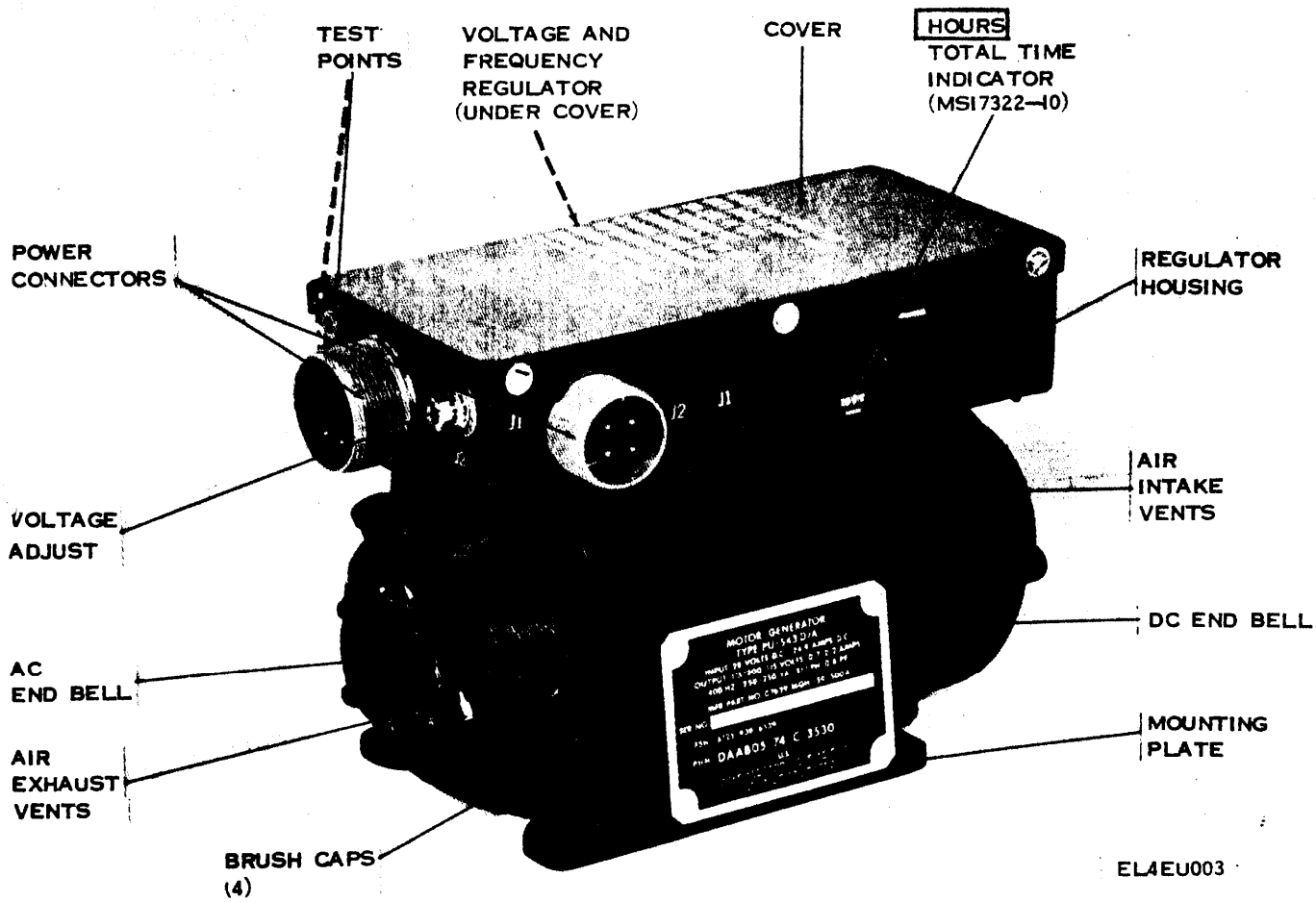

Figure 1-3. Motor-Generator PU-543D/A.

CHAPTER 1
INTRODUCTION

Section I. GENERAL

1-1. Scope

a. This manual provides organizational maintenance instructions for Motor-Generators PU-543/A (modified), PU-543A/A (modified), PU-543B/A, PU-543C/A, and PU-543D/A. Appendix A contains references to additional documents to support the procedures contained in this manual. Appendix B contains a maintenance allocation chart (MAC) for this equipment.

b. Official nomenclature followed by (*) indicates all models of the equipment covered in this manual.

c. Maintenance of Army aircraft is transitioning to three categories of maintenance. These maintenance categories are aviation unit maintenance (AVUM); aviation intermediate maintenance (AVIM); and depot maintenance. AVUM and AVIM will replace organizational, direct support, and general support maintenance. In the interim, as maintenance units are reorganized into three categories of maintenance activities, this publication will be used by AVUM or organizational personnel for the maintenance of Motor-Generator PU-543(*)/A. The maintenance allocation chart (app B) is configured to the three-category maintenance concept where the code O represents AVUM; the codes F and H represent AVIM; and D represents depot maintenance. Those organizations not yet assigned complete AVUM responsibilities should be cautious when using the publication. Whatever maintenance is performed must consider available skills, tools, test equipment, and time required to perform the maintenance.

1-2. Indexes of Publications

a. DA Pam 310-4. Refer to the latest issue of DA Pam 310-4 to determine whether there are new editions, changes, or additional publications pertaining to the equipment.

b. DA Pam 310-7, Refer to DA Pam 310-7 to determine whether there are modification work orders (MWO's) pertaining to the equipment.

1-3. Forms and Records

a. Reports of Maintenance and Unsatisfactory Equipment. Maintenance forms, records, and reports which are to be used by maintenance personnel at all maintenance levels are listed and prescribed by TM 38-750.

b. Reports of Packaging and Handling Deficiencies. Fill out and forward DD Form 6 (Packaging Improvement Report) as prescribed in AR 700-58/NAVSUPINST 4030.29/AFR 7l-13/MCO P4030.29A, and DSAR 4145.8.

c. Discrepancy in Shipment Report (DISREP) (SF 361). Fill out and forward Discrepancy in Shipment Report (DISREP) (SF 361) as prescribed in AR 55-38/ NAVSUPINST 4610.33 A/AFR 75-18/MCO P4610.19B, and DSAR 4500.15.

1-4. Reporting Equipment Improvement Rem commendations (EIR)

EIR's will be prepared using DA Form 2407, (Maintenance Request). Instructions for preparing EIR's are provided in TM 38-750, The Army Maintenance Management System. EIR's should be mailed direct to Commander, US Army Electronics Command, ATTN: DRSEL-MA-Q, Fort Monmouth, NJ 07703. A reply will be furnished direct to you.

1-5. Administrative Storage

Administrative storage of equipment issued to and used by Army activities shall be in accordance with TM 740-90-1.

1-6. Destruction of Army Electronics Materiel

Destruction of Army electronics materiel to prevent enemy use shall be in accordance with TM 750-244-2.

Section II. DESCRIPTION AND DATA

1-7. Purpose and Use

a. Motor-Generator PU-543(*)/A (hereinafter referred to as the inverter) meeting the requirements of MS21983, converts the 28V direct current (dc) from an aircraft power supply to 115V, 400 Hz alternating current (ac), single phase, or to 115/200 volts, 400 Hz ac, 3-phase. The output can be either single-phase or three-phase, but not both at the same time.

b. The inverter is used to supply ac to those items of an aircraft configuration which require ac power for operation.

1-8. Description

(fig. 1-1, 1-2, and 1-3)

The inverter is a self-contained unit consisting of a static voltage and frequency regulator *(a* below) and a rotating section *(b* below).

a. Voltage and Frequency Regulator. The regulator is housed in a rectangular metal box permanently attached

to the top of the stator housing of the inverter. The top of the regulator box is a cover which can be removed, for inspection of the regulator, by loosening the screw fasteners. The power input and output are connected to the inverter through either of two power connectors located on the front and on the side of the regulator box. (Refer to the applicable aircraft technical manual.) Also provided on the front of the regulator housing are two test point jacks for checking the ac output.

NOTE

The two inverter power connectors are used to make the inverter compatible with any aircraft configuration which uses a 250 volt-ampere (va) inverter. Only one of the power connectors is used in an installation. When either power connector is used, the other power connector is disconnected from the inverter power circuits (para 2-3).

b. Rotating Section. The rotating section of the inverter is contained in a heavy metal frame which is the stator housing. The inverter mounting plate is a fixed part of the bottom of the stator housing, and it has holes for attaching the inverter to the aircraft mounting. An endbell on each end of the inverter gives access for inspection of the rotating parts. Both endbells are slotted to provide an airflow through the rotating section for cooling. The airflow intake is through the dc endbell, and the airflow exhaust, through the ac endbell. In the PU-543/A, (modified), PU-543A/A (modified), PU-543C/A, and PU-543D/A four dc brushes are located internally within the dc endbell. In the PU-543B/A, the four dc brushes are installed at the dc end of the inverter and are externally accessible for maintenance. The PU-543D/A (fig. l-3) also contains a Total Time Indicator (MS17322-10) which indicates total running time of the inverter in HOURS.

c. Additional Equipment Required. A 28-volt dc power source is required to supply the input power to the inverter

1-9. Tabulated Data

Voltage input	28 volts dc.
Current input	24 amperes dc.
Voltage output, three phase	115/208 volts ac ± 6.
Voltage output, single phase	115 volts ac ± 6.
Power output	250volt-amperes.
Frequency output	400 Hz ± 10.
Power factor	0.8 lag to 0.9 lead.
Operating speed	12,000 revolutions per minute.
Altitude range	0 to 65,000 feet.
Phase rotation:	
Wye output (4-pin connector)	A,B,C.
Delta output (4-pin connector)	A,B,C.
Weight	11.8 lb (PU-543B/A). 13.8 lb (all others).
Size	6.25 in. high, 9.25 in. deep, 4.75 in. wide.

1-10. Items Comprising An Operable Equipment

The inverter in itself comprises an operable equipment.

CHAPTER 2
INSTALLATION AND OPERATION

Section I. SERVICE UPON RECEIPT

2-1. Unpacking PU-543B/A

a. Packaging Data. When packed for shipment, the inverter is placed in an inner corrugated carton, which is protected by a moisture-vapor-proof barrier and placed in an outer corrugated carton (fig. 2-1). The inverter consists of a single unit 6.25 inches high, 9.24 inches deep, 4.75 inches wide, and weighs 13.8 pounds.

b. Removing Contents. Perform the following steps when unpacking the equipment from the corrugated cartons.

(1) Open the outer corrugated carton.

(2) Remove the moisture-vaporproof barrier with its contents.

(3) Open the moisture-vaporproof barrier, and remove the inner corrugated carton.

(4) Open the inner corrugated carton and remove the desiccant and the inverter.

2-2. Unpacking PU-543/A (Modified), PU-543A/A (Modified), PU-543C/A, or PU-543D/A

a. Packaging Data. When packed for shipment, the inverter (except model PU-543B/A) is mounted on a wooden board, protected by a moisture-vaporproof barrier, and placed in an outer corrugated carton. The inverter (except model PU-543B/A) is a single unit 6.25 inches high, 9.24 inches deep, 4.75 inches wide, and weighs 11.8 pounds.

b. Removing Contents. Perform the following steps when unpacking the appropriate model inverter from the corrugated cartons.

(1) Open the cardboard carton (fig. 2-2).

(2) Lift the barrier-wrapped inverter, mounted on the wooden board, from the carton.

(3) Remove the waterproof-vaporproof barrier from the inverter.

(4) Remove the nuts that secure the inverter to the wooden board; remove the inverter.

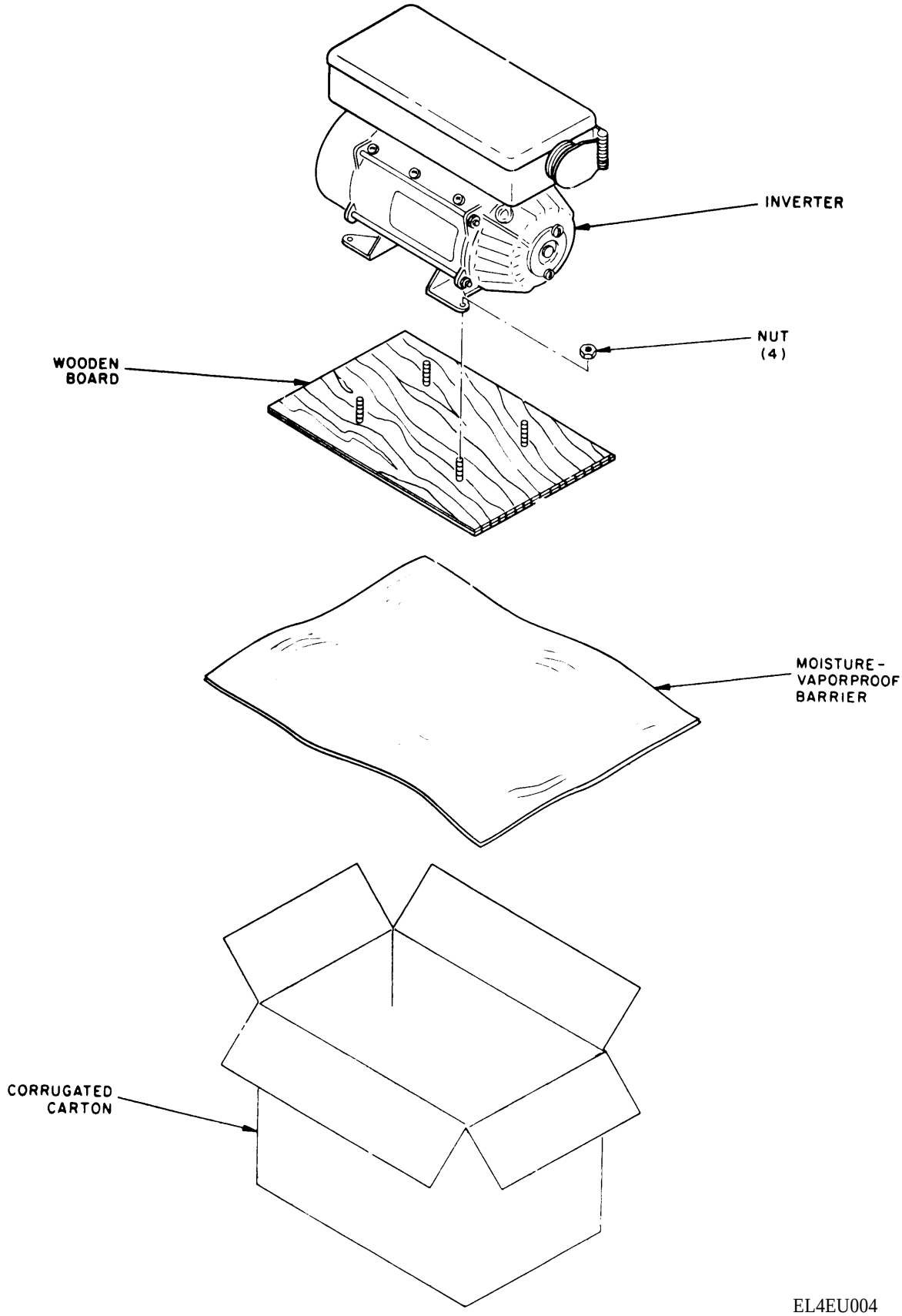

Figure 2-1. Typical Packaging Diagram, PU-543B/A.

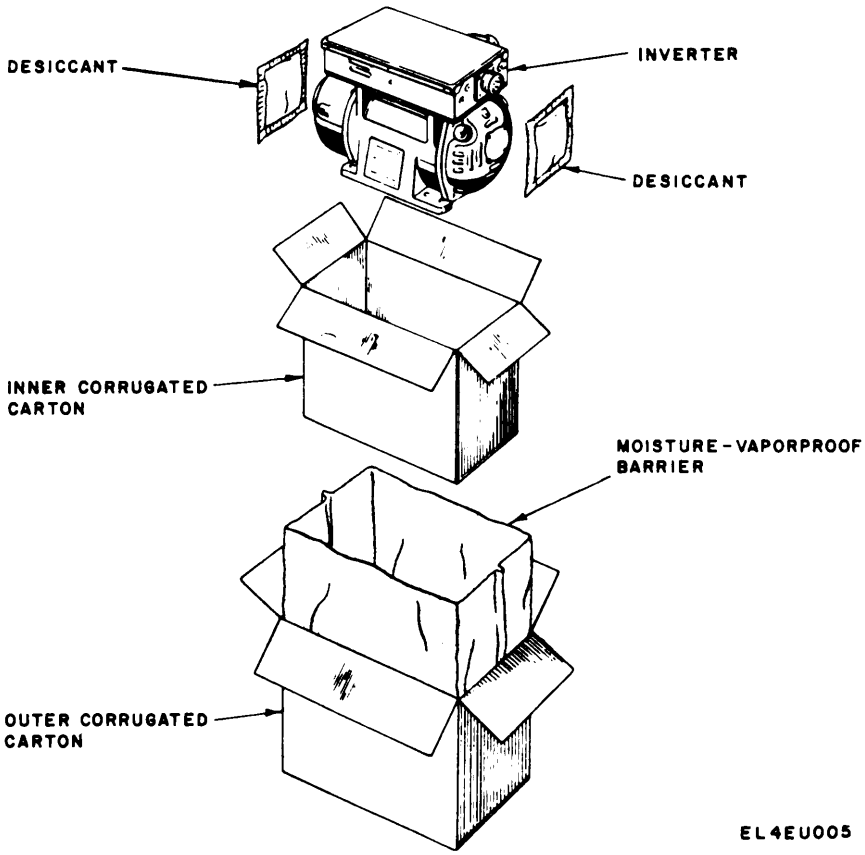

Figure 2-2. Typical Packaging Diagram, PU-543/A (Modified), PU-543A/A (Modified), PU-543C/A, and PU-543D/A.

2-3. Checking Unpacked Equipment

a. Inspect the equipment for damage incurred during shipment. If the equipment has been damaged, report the damage on DD Form 6 (para 1-3).

b. Check the equipment against the component listing in the packing slip to see if the shipment is complete. Report all discrepancies in accordance with paragraph 1-3. The equipment should be placed in service even though a minor assembly or part that does not affect proper functioning is missing.

c. Check to see whether the equipment has been modified. (Equipment which has been modified will have the MWO number on the front panel, near the nomenclature plate.) Check also to see whether all current applicable MWO's have been applied. (Current MWO's applicable to the equipment are listed in DA Pam 310-7.)

2-4. Installation

The output and input power of the inverter is routed through the circuits of the aircraft in which the inverter is installed. Refer to the applicable aircraft technical manual for the desired mode of operation, the physical location within the aircraft, and to the procedures in *a* and *b* below for the proper output connections at the ac power connector. A typical installation procedure is provided in *c* below.

WARNING

Never connect or disconnect the inverters while dc power is present at the connectors.

a. PU-543/A (Modified), PU-543A/A (Modified), PU-543C/A, and PU-543D/A (fig. 2-3). Modification of the PU-543/A or PU-543A/A was necessary to replace the automatic switching feature. When modified, the automatic switching feature was replaced by an internally mounted, manually operated, terminal block assembly to make its operation identical with the PU-543C/A and PU-543D/A. If a three-phase output is required, the movable terminal board must be positioned on fixed terminal board TB2 (closest to the ac endbell) for an output from 11-pin connector J2. Loosen the seven terminal screws on movable terminal board TB3, reposition the terminal board, and secure the terminal leads and seven terminal screws. If a single-phase output is required (output from four-pin connector J1), movable terminal board TB3 must be positioned on terminal board TB1 (farthest from ac endbell). The position of the movable terminal board is externally indicated by the appearance of a red mark in one of the two sight holes located on the side of the regulator box.

b. PU-543B/A (fig. 2-4). Before installing the PU-543B/A, check the internal linkages for the proper connections. If the aircraft wiring requires single-phase power from the four-pin connector, the linkage straps in the regulator box must be connected for a delta output (C to H, A to J, and B to E). If a three-phase, four-wire Wye output (from the 11-pin connector) is required, the linkage straps must be changed (O to H, O to J, and O to E).

c. Typical Installation Procedure.

(1) Make sure that the portion of the aircraft mounting that corresponds to the inverter mounting base is free from oil and grease to be sure of good electrical grounding.

(2) Position the inverter on the aircraft mounting line up the holes in the inverter mounting base with the holes in the aircraft mounting.

(3) Secure the inverter to the aircraft mounting with the four sets of mounting hardware.

(4) Connect the power cable to the ac power connector of the inverter.

(5) Connect the dc input leads to the terminal board studs; maintain the proper polarity.

(6) If the inverter is a PU-543D/A, record the inverter serial number and HOURS total time indicator (fig. 1-3) reading in the aircraft log book.

d. Removal. To remove the inverter for maintenance or repair, reverse the procedures in *a* (3) through (6) above.

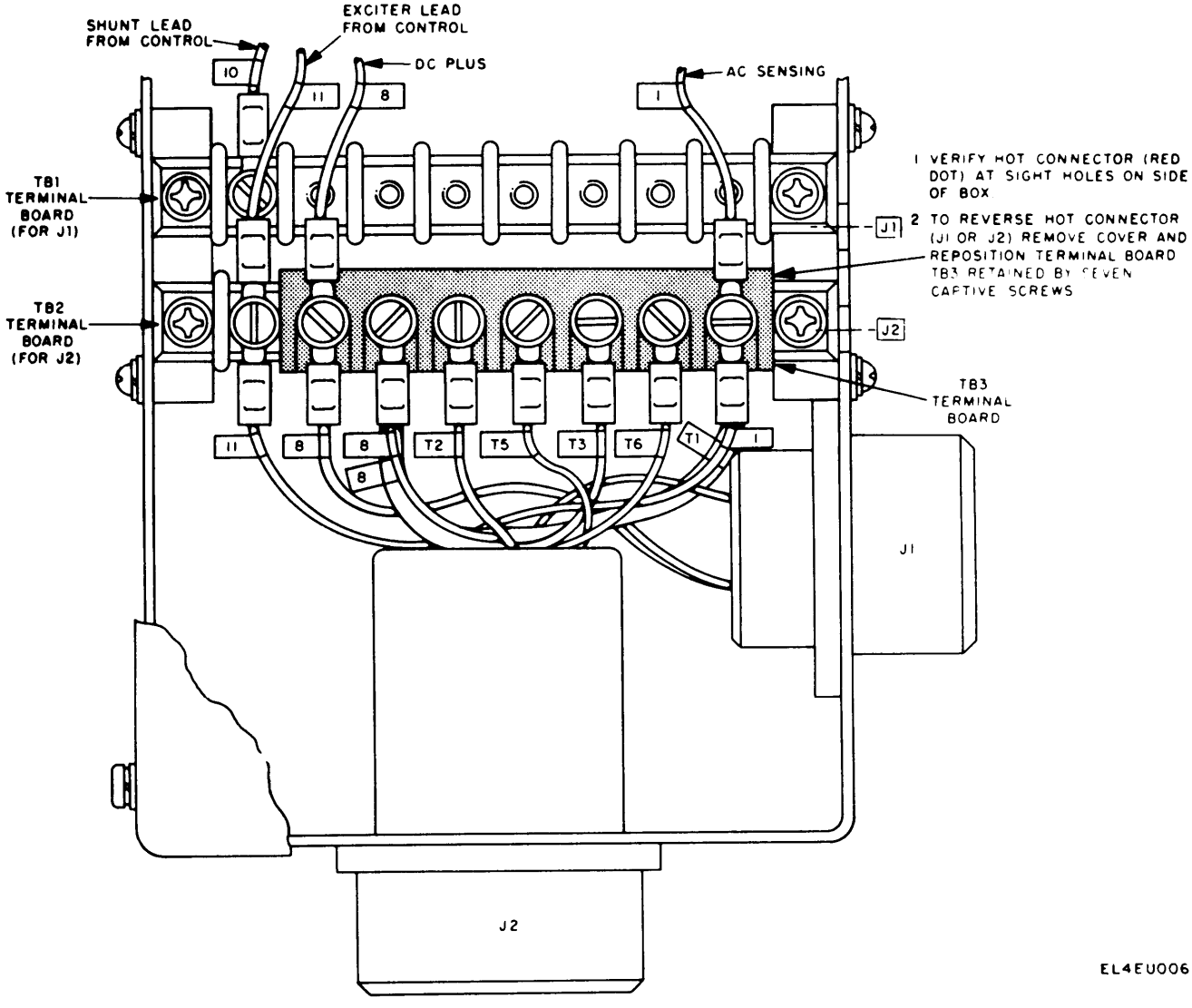

Figure 2-3. PU-543/A (Modified), PU-543A/A (Modified), PU-543C/A, and PU-543D/A, Internal Terminal Board Connections.

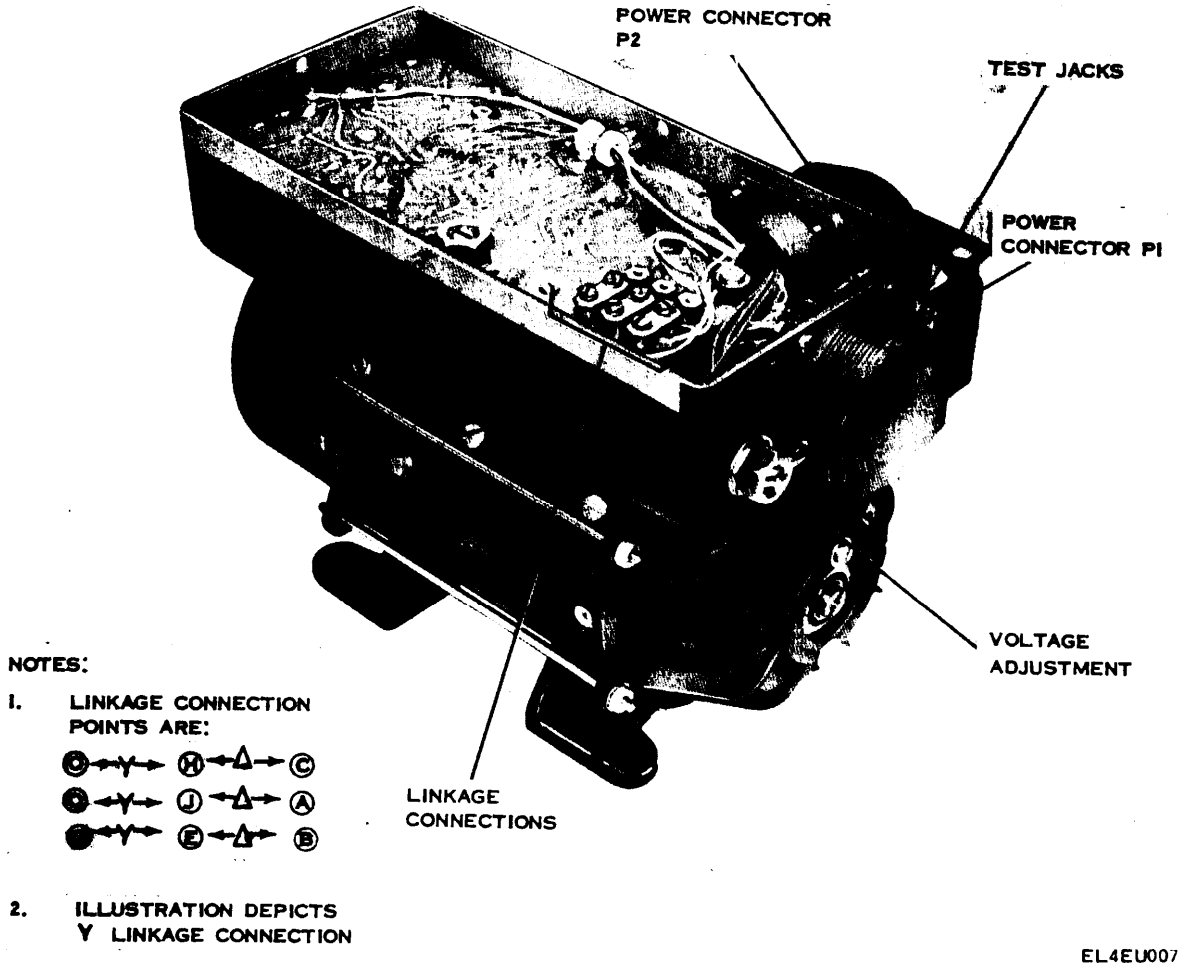

Figure 2-4. PU-543B/A, Cover Removed.

Section II. OPERATION

2-5. General

The inverter must be energized before use and deenergized after use; no other operation is required. The inverter contains no on/off switch. It is energized automatically when the aircraft 28 vdc power is applied and deenergized when the power is removed. No warmup is required before use. The input and output power is routed through other circuits of the aircraft in which the inverter is installed. Refer to the applicable aircraft technical manual for the proper switching sequence for operating the inverter.

2-6. Starting and Stopping Operation

a. Starting. Turn on the necessary aircraft switches to apply the 28 vdc to energize the inverter. The motor should start.

CAUTION

After starting the inverter, check for smoke or any other sign of malfunction. If any malfunction is noted, immediately remove the 28 vdc power.

b. Stopping. Turn off the necessary aircraft switches to remove the 28 vdc from the inverter.

2-7. Initial Operational Check

a. General. The operational check (b below) supplements the inspection procedures in the aircraft operator's condensed checklist. The operator's inspection consists of checking serviceability by performing an operational check. The checks listed should be accomplished before a flight. The pilot or copilot should report any malfunction or failure noted during the flight, or any discrepancy noted in the preflight check (TM 38-750).

b. Operational Check. The following preflight checks should be made as an extension of the ground tests in the applicable aircraft operator's condensed checklist. The checks should be performed in the order given.

NOTE

Use an external power source for making functional checks to prevent drain on aircraft batteries. (Refer to applicable aircraft technical manual.)

(1) Start the inverter. If the aircraft in which the inverter is installed is equipped with panel meters for indicating the ac voltage and frequency, check the output of the inverter on the meters. (Refer to applicable aircraft technical manual.) If the inverter is performing satisfactorily, the voltmeter should indicate between 109 and 121 or 202 and 214 volts ac, and the frequency meter should indicate between 390 and 410 Hz. Vary the load from no load to full load by turning on the aircraft equipment that operates with the ac supplied by the inverter. (Refer to the applicable aircraft technical manual.) The voltage indicated on the voltmeter should not vary more than 1 volt, and the indicated frequency variation should be less than 6 Hz.

(2) If no ac panel meters are installed in the aircraft, check to see that the inverter is running by listening to the motor. Turn on any aircraft equipment that operates from the ac supplied by the inverter and check to see that the equipment is operating. (Refer to the applicable aircraft technical manual.)

(3) Turn off the necessary aircraft switches to stop the inverter.

CHAPTER 3
ORGANIZATIONAL MAINTENANCE INSTRUCTIONS

3-1. Tools and Test Equipment

Tools and test equipment required for organizational maintenance of the inverter are listed in section III, appendix B of this manual.

3-2. Paints and Finishes

When the inverter requires repainting, refinishing, or touchup painting refer to Federal Standard No. 595A for a matching color. SB 11-573 lists the tools and miscellaneous supplies required for painting.

3-3. Touchup Painting Instructions

a. Refer to TB 43-0108 for instructions on painting and preserving Electronics Command equipment. In touchup painting a perfect match with the exact shade of the original paint may not be possible. The prevention of corrosion and deterioration is the most important consideration in touchup painting; appearance is secondary. This should not be construed to mean that the appearance of the equipment is unimportant. Touchup painting should be accomplished neatly, and in a good professional manner. Field inspection personnel will make allowance for slight color mismatch where minor touchup has been done, but not for neglect or poor quality of work.

b. Remove rust and corrosion from metal surfaces by lightly sanding them with fine sandpaper. Brush two thin coats of paint on the bare metal to protect it from further corrosion.

3-4. Lubrication

No lubrication is required at organizational category.

3-5. Preventive Maintenance Checks and Services

a. To be sure that the inverter is always ready for operation, it must be inspected systematically so that defects may be discovered before they result in serious damage or failure. The necessary preventive maintenance checks and services (PMCS) are listed and described in tables 3-1 and 3-2. The item numbers indicate the sequence of the minimum inspection requirements. Defects discovered during operation of the unit will be noted for future correction to be made as soon as operation has ceased. Stop operation immediately if a deficiency is noted during operation which would damage the equipment. Record all deficiencies together with the corrective action taken in accordance with TM 38-750.

b. Perform the maintenance functions in table 3-1 once each intermediate interval. An intermediate interval is defined as approximately 75 flying hours. The intermediate PMCS on the inverter should be performed concurrently with the intermediate PMCS scheduled on the aircraft in which the equipment is installed. Adjustments of the maintenance interval must be made to compensate for any unusual operating conditions. Equipment maintained in a standby (ready for immediate operation) condition must have intermediate maintenance performed on it at least once every 30 days. Equipment in limited storage (requires service before operation) does not require intermediate maintenance.

c. Perform the maintenance functions in table 3-2 once each periodic interval in addition to the intermediate PMCS in table 3-1. Periodic preventive maintenance will be scheduled in accordance with the requirements of TM 38-750. The periodic preventive maintenance inspection should be scheduled concurrently with the periodic maintenance service schedule of the aircraft in which the inverter is installed to reduce out-of-service time. Refer to the applicable aircraft technical manual for the hours between service periods.

Table 3-1. Intermediate PMCS

Total time required: 0.4

Sequence No.	ITEM TO BE INSPECTED PROCEDURE	Work time (T/H)
1	EXTERNAL WIRING: Inspect external wires and cable for damaged insulation of jacketing.	0.1
2	AIR VENTS: Check the airflow intake and exhaust vents for obstructions.	
3	EXTERIOR SURFACES: Remove dirt and moisture, and inspect for rust, corrosion, and chipped paint.	0.1

Table 3-1 Intermediate PMCS (cont.)

Total time required: 0.4

Sequence No.	ITEM TO BE INSPECTED PROCEDURE	Work time (T/H)
4	MOUNTING: Check for cleanliness, stability, and loose or missing hardware.	
5	ELECTRICAL CAPS: When accessible, check the electrical brush caps for seating. Do not remove, reek, or twist to inspect. Use only a direct pressure to be sure that the cap is fully seated.	0.1
6	CONNECTIONS: Cheek connections at terminal board and ac power connector and see that they are clean, intact, and secure.	0.1
'7	OPERATION: During operation be alert for signs of malfunction such as excessive vibration, overheating, or variations in output voltage and frequency. Refer to the operational check in paragraph 2-7.	

Table 3-2. Periodic PMCS

Total time required: 0.5

Sequence No.	ITEM TO BE INSPECTED PROCEDURE	Work time (T/H)
1	PUBLICATIONS: Cheek to see that all publications pertinent to this equipment are on hand, complete, and usable. Check DA Pam 310-4 for recent changes to publications.	0.1
2	MODIFICATIONS: Check DA Pam 310-7 to see that all URGENT MWO's have been applied, and that all NORMAL MWO's have been scheduled.	0.1
3	INSTALLATION: Check to see that the inverter is properly secured with safety wire attached.	
4	SLIPRINGS: Remove the ac end cover and inspect the sliprings for excessive wear and pitting.	0.1
5	AC CONTACT BRUSHES: When accessible, remove the ac contact brushes as in paragraph 3-8 and inspect for wear, cracks, chips, and broken flexible wire. Check brush holders and springs for cleanliness and proper tension. Refer inverter to direct support maintenance for replacement.	0.1

3-6. Cleaning

All exterior surfaces of the inverter should be free of dirt, grease, and fungus. Perform the following procedures as specified in the preventive maintenance checks and services table 3-1.

a. Remove moisture and loose dirt with a clean soft cloth.

WARNING

The fumes of trichloroethane are toxic. Provide thorough ventilation whenever used. DO NOT USE NEAR AN OPEN FLAME. Trichloroethane is not flammable, but exposure of the fumes to an open flame or hot metal surface forms highly toxic phosgene gas. Avoid prolonged skin contact with trichloroethane.

b. Remove grease, fungus, and ground-in dirt from the exterior surfaces with a clean cloth dampened (not wet) with trichloroethane. Wipe dry with a clean, dry, lint-free cloth.

c. Remove dust or dirt from ac power connector and associated plug with a soft-bristle brush.

3-7. Troubleshooting

The troubleshooting procedures in table 3-3 are based upon symptoms noted while the inverter is in operation. Any malfunction observed that is not included in the table should be referred to higher category maintenance.

Table 3-3. Troubleshooting

Malfunction	Possible cause	Corrective action
Inverter vibrates	*a.* Loose or missing hardware. *b.* Inverter improperly seated.	*a.* Tighten or replace hardware. *b.* See that mounting surface is clean and free of foreign objects. If trouble is not corrected higher category maintenance is required.
Inverter fails to start	*a.* Loose or blown fuses or open circuit breaker in dc line.	*a.* Check and replace or reset as required.
	b. Short circuit in dc line...	*b.* Check aircraft line fuses or circuit breakers. If blown, inspect wiring between fuses or circuit breakers and inverter. Repair wiring as necessary.
	c. Dc brushes not making contact with commutator.	*c.* Refer inverter to higher category maintenance.
	d. Dc input circuit open	*d.* Check wiring and connection to the inverter for an open circuit. Repair or replace as necessary.
	e. Armature jammed	*e.* Refer inverter to higher category maintenance.
Inverter runs but fails to deliver proper voltage or frequency	*a.* Ac circuit open.	*a.* Connect an AN/UPM-93 to the test point jacks on the front of the regulator (fig, 1-1, 1-2, or 1-3), and start the inverter. If indication is between 109 and 121 vac, 390 and 410 Hz, check exterior wiring and connections for an open circuit, and repair. If indication is not specified, refer inverter to higher category maintenance.
	b. Slipring brushes not making contact with slipring.	*b.* Remove ac electrical end caps and check for broken brushes or springs. Refer inverter to higher category maintenance.
	c. Regulator failure.	*c.* Refer inverter to higher category maintenance.
Ac output voltage is low	*a.* Dc input voltage is low.	*a.* Check dc voltage at power supply and correct.

Table 3-3. Troubleshooting (cont.)

Malfunction	Possible cause	Corrective action
	b. Misadjustment of increase volts adjustment resistor.	*b.* Readjust increase volts adjustment resistor as described in paragraph 3-9.
Ac output voltage is high	*a.* Dc input voltage is higher than 30V.	*a.* Check dc voltage at power supply and correct.
	b. Misadjustment of voltage adjustment resistor.	*b.* Readjust as described in paragraph 3-9.
	c. Regulator failure.	*c.* Refer inverter to higher category maintenance.
Speed (frequency) is too high or too low.	Misadjustment of internal frequency adjustment resistor.	Refer inverter to higher category maintenance.
Output voltage unstable	*a.* Loose connections.	*a.* Check and tighten connections as necessary. If trouble persists refer to higher category maintenance.
	b. Poor commutation or poor brush contact at sliprings.	*b.* Check and refer to higher category maintenance.
Speed (frequency) is too high or too low.	Misadjustment of increase adjustment resistor.	Refer inverter to higher category maintenance.
Output voltage unstable.	*a.* Loose connections.	*a.* Check and tighten connections as necessary. If trouble persists refer to higher category maintenance.
	b. Poor commutation or poor brush contact at sliprings.	*b.* Check and refer to higher category maintenance.

3-8. Maintenance.

Periodic inspection of the ac contact brushes is the only maintenance performed at the organizational level. This inspection may be performed in the aircraft if the inverter can be reached easily. Otherwise, remove the inverter as described in paragraph 2-4.

WARNING

If the inverters are located in the nose of a helicopter, adjustment of the VOLTAGE control must be made with the aircraft engine inoperative and an auxiliary power unit (apu) connected as the source of aircraft power. Should an apu not be available and the aircraft engine required to be operating for power, access to the inverters must be made through the nose compartment access door to keep the person making the adjustment clear of the aircraft flight controls.

3-9. Output Voltage Adjustment

The VOLTAGE adjustment (fig. 1-1, 1-2, or 1-3) is adjusted to provide 115-volts ac output, Follow the procedures given below.

a. Turn on the necessary aircraft switches to start the inverter. Set the AN/URM-105 range to 1000 AC VOLTS and connect the test leads to the test point jacks on the front of the inverter regulator housing. Note the output voltage reading.

b. Loosen the locknut on the VOLTAGE adjustment shaft. Using a screwdriver, turn the VOLTAGE adjustment shaft clockwise to increase the output or counterclockwise to decrease the output voltage until the AN/URM indicates a reading of 115 vac.

c. After adjustment has been made, tighten the locknut on the VOLTAGE adjustment shaft. Disconnect the leads of the AN/URM-105 from the inverter. Turn off the aircraft switches to remove power from the inverters.

APPENDIX A
REFERENCES

DA Pam 310-4	Index of Technical Manuals, Technical Bulletins, Supply Manuals (Types. 7, 8, and 9), Supply Bulletins, and Lubrication Orders.
DA Pam 310-7	US Army Equipment Index of Modification Work Orders.
SB 11-573	Painting and Preservation Supplies Available for Field Use for Electronics Command Equipment.
TB 43-0118	Field Instructions for: Painting and Preserving Electronics Command Equipment including Camouflage Pattern Painting of Electrical Equipment Shelters.
TB 385-4	Safety Precautions for Maintenance of Electrical/Electronic Equipment.
TM 11-5625-203-12	Operator and Organizational Maintenance: Multimeter AN/URM-105 and AN/URM-105C including Multimeter ME-77/U and ME-77C/U.
TM 38-750	The Army Maintenance Management System (TAMMS).
TM 740-90-1	Administrative Storage of Equipment.
TM 750-244-2	Procedures for Destruction of Electronics Material to Prevent Enemy Use (Electronics Command).

APPENDIX B
MAINTENANCE ALLOCATION

Section I. INTRODUCTION

B-1. General

This appendix provides a summary of the maintenance operations for PU-543( )/A. It authorizes categories of maintenance for specific maintenance functions on repairable items and components and the tools and equipment required to perform each function. This appendix may be used as an aid in planning maintenance operations.

B-2. Maintenance Function

Maintenance functions will be limited to and defined as follows:

a. Inspect. To determine the serviceability of an item by comparing its physical, mechanical, and/or electrical characteristics with established standards through examination.

b. Test. To verify serviceability and to detect incipient failure by measuring the mechanical or electrial characteristics of an item and comparing those characteristics with prescribed standards.

c. Service. Operations required periodically to keep an item in proper operating condition, i.e., to clean (decontaminate), to preserve, to drain, to paint, or to replenish fuel, lubricants, hydraulic fluids, or compressed air supplies.

d. Adjust. To maintain, within prescribed limits, by bringing into proper or exact position, or by setting the operating characteristics to the specified parameters.

e. Align. To adjust specified variable elements of an item to bring about optimum or desired performance.

f. Calibrate. To determine and cause corrections to be made or to be adjusted on instruments or test measuring and diagnostic equipments used in precision measurement. Consists of comparisons of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared.

g. Install. The act of emplacing, seating, or fixing into position an item, part, module (component or assembly) in a manner to allow the proper functioning of the equipment or system.

h. Replace. The act of substituting a serviceable like type part, subassembly, or module (component or assembly) for an unserviceable counterpart.

i. Repair. The application of maintenance services (inspect, test, service, adjust, align, calibrate, replace) or other maintenance actions (welding, grinding, riveting, straightening, facing, remachining, or resurfacing) to restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, subassembly, module (component or assembly), end item, or system. This function does not include the trial and error replacement of running spare type items such as fuses, lamps, or electron tubes.

j. Overhaul. That maintenance effort (service/action) necessary to restore an item to a completely serviceable/ operational condition as prescribed by maintenance standards (i.e., DMWR) in appropriate technical publications. Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to like new condition.

k. Rebuild. Consists of those services/actions necessary for the restoration of unserviceable equipment to a like new condition in accordance with original manufacturing standards. Rebuild is the highest degree of materiel maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurements (hours, miles, etc.) considered in classifying Army equipments/components.

B-3. Column Entries

a. Column 1, Group Number. Column 1 lists group numbers, the purpose of which is to identify components, assemblies, subassemblies, and modules with the next higher assembly.

b. Column 2, Component/Assembly. Column 2 contains the noun names of components, assemblies, subassemblies, and modules for which maintenance is authorized.

c. Column 3, Maintenance Functions. Column 3 lists the functions to be performed on the item listed in column 2. When items are listed without maintenance functions, it is solely for purpose of having the group numbers in the MAC and RPSTL coincide.

d. Column 4, Maintenance Category. Column 4 specifies, by the listing of a "worktime" figure in the

appropriate subcolumn(s), the lowest level of maintenance authorized to perform the function listed in column 3. This figure represents the active time required to perform that maintenance function at the indicated category of maintenance. If the number or complexity of the tasks within the listed maintenance function vary at different maintenance categories, appropriate "worktime" figures will be shown for each category. The number of task-hours specified by the "worktime" figure represents the average time required to restore an item (assembly, subassembly, component, module, end item or system) to a serviceable condition under typical field operating conditions. This time includes preparation time, trouble-shooting time, and quality assurance/quality control time in addition to the time required to perform the specific tasks identified for the maintenance functions authorized in the maintenance allocation chart. Army aircraft field maintenance levels are transitioning to Aviation Unit Maintenance (AVUM) and Aviation Intermediate Maintenance (AVIM). Subcolumns of column 4 are as follows:

C—Operator/Crew
O—Organizational (AVUM)
F—Direct Support (AVIM)
H—General Support (AVIM)
D—Depot

e. Column 5, Tools and Equipment. Column 5 specifies by code, those common tool sets (not individual tools) and special tools, test, and support equipment required to perform the designated function.

f. Column 6, Remarks. Column 6 contains an alphabetic code which leads to the remark in section IV, Remarks, which is pertinent to the item opposite the particular code.

6-4. Tool and Test Equipment Requirements (Sec III).

a. Tool or Test Equipment Reference Code. The numbers in this column coincide with the numbers used in the tools and equipment column of the MAC. The numbers indicate the applicable tool or test equipment for the maintenance functions.

b. Maintenance Category. The codes in this column indicate the maintenance category allocated the tool or test equipment.

c. Nomenclature. This column lists the noun name and nomenclature of the tools and test equipment required to perform the maintenance functions.

d. National/NATO Stock Number. This column lists the National/NATO stock number of the specific tool or test equipment.

e. Tool Number. This column lists the manufacturer's part number of the tool followed by the Federal supply Code for manufacturers (5-digit) in parentheses.

B-5. Remarks (See IV).

a. Reference Code. This code refers to the appropriate item in section II, column 6.

b. Remarks. This column provides the required explanatory information necessary to clarify items appearing in section II.

(Next printed page is B-3.)

SECTION II MAINTENANCE ALLOCATION CHART
FOR

MOTOR-GENERATOR PU-543(*)/A

(1) GROUtP NUMBER	(2) C0MP0NENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) (NOTE) MAINTENANCE CATEGORY					(5) TOOLS AND EQPT.	(6) REMARKS
			C	O	F	H	D		
00	MOTOR-GENERATOR PU-543, A, B, C/A	Inspect		0.1					A
		Service		0.1				1,2,3	B
		Test		0.1				1,2	C
		Adjust		0.1					
		Replace		0.5					
		Overhaul					9	3thru32	
01	REGULATOR SECTION	Test			0.2			3thru10	
		Adjust			0.2			3thru5	B
		Replace			1.0				
		Repair				1.5		3thrul2	
02	GENERATOR SECTION	Inspect			0.2				
		Replace			1.0			4,7,8	D
		Service			0.5				E
		Adjust				0.3		4,7,8	F
		Replace				2.0		4,17thru 21	G
		Test				1.5		3thru16	H

NOTE:

O represents AVUM
F/H represents AVIM

Section III. TOOL AND TEST EQUIPMENT REQUIREMENTS FOR MOTOR-GENERATOR PU-543(*)/A

T00L OR TEST EQUIPMENT REF CODE	MAINTENANCE CATEGORY	NOMENCLATURE	NATIONAL/NATO STOCK NUMBER	TOOL NUMBER
1	O	TOOL KIT, ELECTRONIC EQUIPMENT TK-101	5180-00-064-5178	
2	0	MULTIMETER, AN/URM-105	6625-00-581-2036	
3	O,F,H,D	TEST SET, ELECTRICAL POWER AN/UPM-93	6625-00-581-2097	
4	F,H,D	T0OL KIT, ELECTRONIC EQUIPMENT TK-1O0	5180-00-605-0079	
5	F,H,D	MULTIMETER AN/USM-223/U (TS-352B/U)	6625-00-999-7465	
6	F,H,D	MULTIMETER ME-26(*)U	6625-00-913-9781	
7	F,H,D	TEST SET, MOTOR-GENERATOR AN,GSM-65	4920-00-348-5793	
8	F,H	POWER SUPPLY, PP-4606/G OR EQUAL	6130-00-504-0327	
9	H,D	BRIDGE RESISTANCE ZM-4B/U	6625-00-500-0937	
10	H,D	TEST SET, CAPACITOR ZM-3(*)/U	6625-00-229-1060	
11	H,D	TEST SET, TRANSISTOR TS-1836(*)/U	6625-00-693-2628	
12	H,D	MOTOR-GENERATOR PU-543(*)/A	6125-00-938-6539	
13	H,D	OHMMETER ZM-21A/U	6625-00-581-2466	
14	H,D	OSCILLOSCOPE ANUSM-281A	6625-00-228-2201	
15	H,D	TEST SET, ARMATURE TS-965(*)/U	6625-00-828-5810	
16	H,D	TEST SET, INSULATION BREAKDOWN AN/GSM-6	6625-00-542-1331	
17	H,D	PLIERS, RETAINING	5120-00-288-9717	
18	H,D	WRENCH, TORQUE	5120-00-54l-3001	
19	H,D	ARBOR PRESS, GREENERD MODEL NO. 3 OR EQUAL		
20	H,D	BEARING PUSHER, BASE AND TOP		
21	H,D	BEARING RETAINER PULLER ASSEMBLY		
22	D	BALANCING MACHINE, GISHOLT TYPE 1S		
23	D	DIAL INDICATOR, LUFKIN MODEL 2-B25-5 (DIAL CALIBRATED TO READ 0.001 INCH)		
24	D	PHASE SEQUENCE INDICATOR, ASSOCIATED RESEARCH INC. (M0DEL 44 (400 HZ) OR EQUAL		
25	D	MODULAR PRECISONAIRE COLUMN, SHEFFIELD 9 INCH MODEL		
26	D	CIRCUIT BREAKER 180 AMPS	5925-00-257-7072	
27	D	DIAMOND-TIPPED OR CARBOLOY-TIPPED CUTTING TOOL		
28	D	POWER SUPPLY, SORENSON MODEL DCR40-500A OR EQUAL		
29	D	OVEN		
30	D	PAINT BOOTH		
31	D	SPRING SCALE	6670-00-291-8721	
32	D	ULTRASONIC CLEANER		

SECTION IV. REMARKS
MOTOR-GENERATOR PU-543(*)/A

REFERENCE CODE	REMARKS
A	Exterior
B	Output voltage and frequency
C	Output voltage only
D	Brushes, including run-in
E	Remove interior brush carbon and dust
F	Brush neutral
G	Bearings
H	Comprehensive tests

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DATE 10 July 1975

PUBLICATION NUMBER	DATE	TITLE
TM 11-5840-340-12	23 Jan 74	Radar Set AN/PPC-76

BE EXACT. . .PIN-POINT WHERE IT IS				IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:
PAGE NO.	PARAGRAPH	FIGURE NO.	TABLE NO.	
2-25	2-28			Recommend that the installation antenna alignment procedure be changed throughout to specify a 2° IFF antenna lag rather than 1°. REASON: Experience has shown that with only a 1° lag, the antenna servo system is too sensitive to wind gusting in excess of 20 knots, and has a tendency to rapidly accelerate and decelerate as it hunts, causing strain to the drive train. Hunting is minimized by adjusting the lag to 2° without degradation of operation.
3-10	3-3		3-1	Item 5, Function column. Change "2 db" to "3db." REASON: The adjustment procedure for the TRANS POWER FAULT indicator calls for a 3 db (500 watts) adjustment to light the TRANS POWER FAULT indicator.
5-6	5-8			Add new step f.1 to read, "Replace cover plate removed in step e.1, above." REASON: To replace the cover plate.
		F03		Zone C 3. On J1-2, change "+24 VDC to "+5 VDC." REASON: This is the output line of the 5 VDC power supply. + 24 VDC is the input voltage.

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SSG I. M. DeSpiritof 999-1776	SSG I. M. DeSpiritof

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