



PRELIMINARY MANUAL AMC-101



**THE TECHNICAL MATERIEL CORPORATION**  
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**OTTAWA, CANADA**



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PRELIMINARY OPERATOR'S AND ORGANIZATIONAL  
MAINTENANCE MANUAL  
COUPLER, ANTENNA CU-1638/GR

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April 1966

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## COUPLER, ANTENNA CU-1638/GR

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CHAPTER 1  
INTRODUCTION

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Section I. GENERAL

1-1. Scope

This manual describes Coupler, Antenna CU-1638/GR (fig 1-1) and covers its installation, operation, operator's maintenance, preventive and periodic maintenance, and basic theory. Hereafter, in this manual, Coupler, Antenna CU-1638/GR will be referred to as the coupler.

1-2. Index of Publications

Refer to the latest issue of DA Pam 310-4 to determine whether there are new editions, changes, or additional publications pertaining to this equipment. Department of the Army Pamphlet No. 310-4 is an index of current technical manuals, technical bulletins, supply manuals (types 7, 8, and 9), supply bulletins, lubrication orders, and modification work orders available through publications supply channels. The index lists the individual parts (-10, -20, -35P, etc) and the latest changes to and revisions of each equipment publication.

1-3. Forms and Records

a. Reports of Maintenance and Unsatisfactory Equipment. Use equipment forms and records in accordance with instructions in TM 38-750.

b. Report of Damaged or Improper Shipment. Fill out and forward DD Form 6 (Report of Damaged or Improper Shipment) as prescribed in AR 700-58 (Army), NAVSANDA Publications 378 (Navy), and AFR 71-4 (Air Force).

c. Reporting of Equipment Manual Improvements. The direct reporting of errors, omissions, and recommendations for improving this equipment manual by the individual user is authorized and encouraged. DA Form 2028 will be used for reporting these improvements. This form may be completed by the use of pencil, pen, or typewriter. DA Forms 2028 will be completed by the individual using the manual and forwarded direct to Commanding General, U S Army Electronics Command, ATTN: AMSEL-MR-(NMP)-MA, Fort Monmouth, New Jersey 07703.

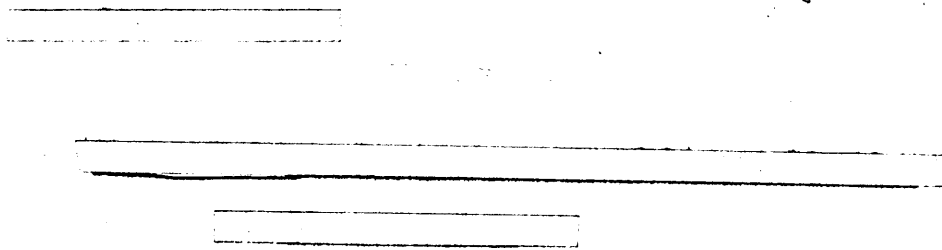


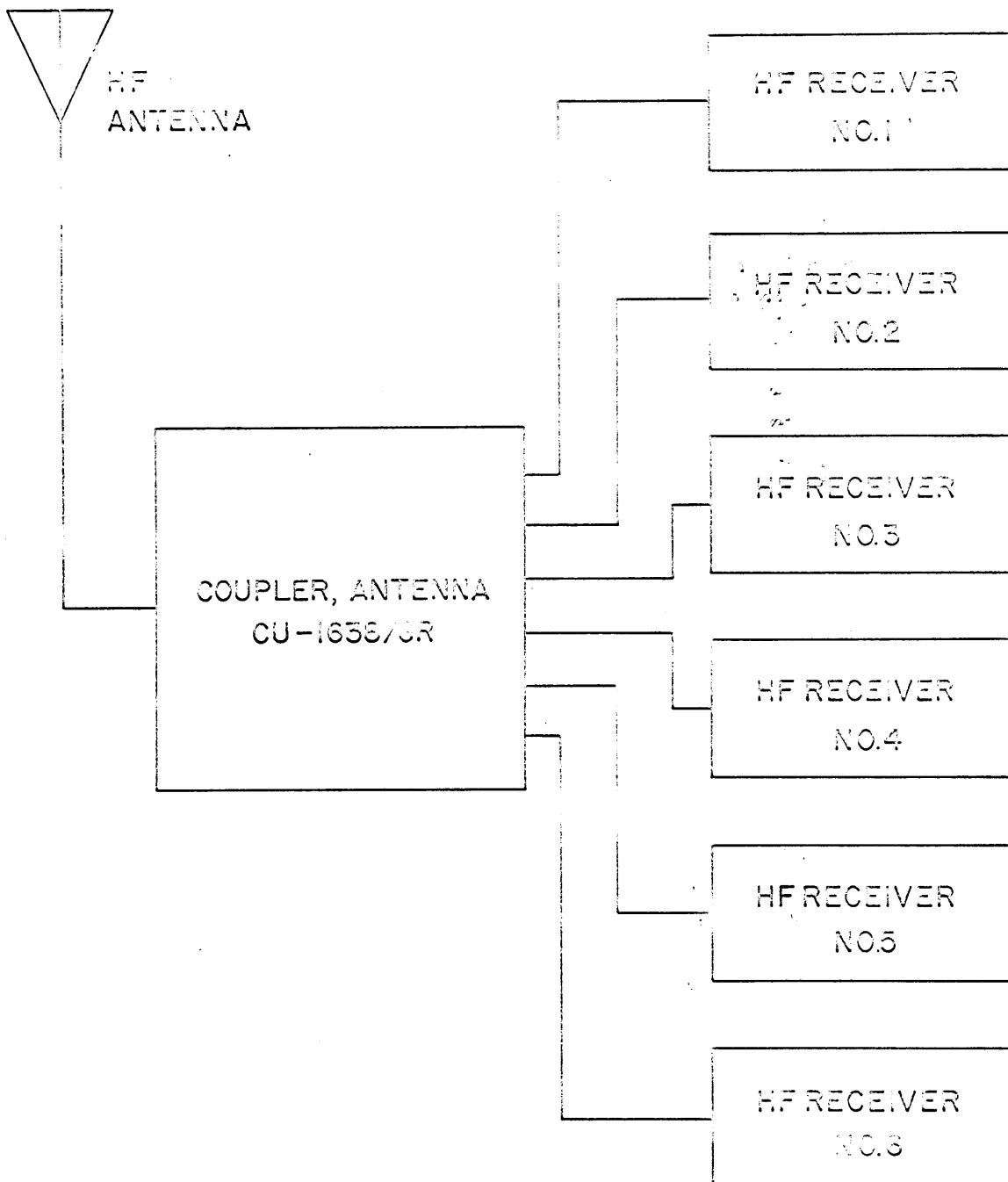
## Section II. DESCRIPTION AND DATA

### 1-4. Purpose and Use

a. The coupler is used for connecting up to six receivers to a single antenna. The coupler operates in the high-frequency region (2 to 30 megacycles (MC)) and will handle all modes of transmission within this frequency range. Rejection is provided to signals not in the above frequency range.

b. Figure 1-2 is a block diagram of a typical installation of the coupler and six high-frequency receivers. The antenna as well as the receivers may be remotely located from the coupler.





TM 5935-243-12-3

### 1-5. Technical Characteristics

Frequency range.....	2 to 30 mc.
Gain.....	3 db.
Frequency response.....	$\pm 1$ db, 2 to 30 mc.
Uniformity of outputs.....	$\pm 0.5$ db.
Input SWR.....	1.5:1 or less.
Input impedance.....	50 ohms.
Output impedance.....	50 ohms.
Noise figure.....	6 db minimum. 7 db maximum.
Intermodulation.....	60 db below two 0.5-volt signals.
Output to output isolation.....	40 db minimum.
Overload.....	3 volts continuous will not cause component failure.
Lightning protection.....	Shunt and series.
Powerline filters.....	Greater than 60 db down from 150 kc to 400 mc.

Environmental.. .. . -40 to +50° C operating  
-60 to +80° storage.  
0 to 95% humidity.

Input and output connectors..... Type N.

Number of transistors..... 18.

Power input..... 115/230 ±10% ac volt RMS, 47 to 63  
cycles, approximately 20 watts.

Size..... 3-1/2" high x 19" wide x 9" deep.

Weight..... 12 pounds.

1-6. Components and Running Spares of Coupler, Antenna CU-1638/GR

a. Components. This equipment consists of only one component.

The dimensions are 3-1/2 inches high x 19 inches wide x 9 inches deep, and the weight is 12 pounds.

b. Running Spares.

Quantity	Item
5	Fuses, 1/4-ampere slo-blo
1	Lamp, #327
1	Transistor, 2N297A

## CHAPTER 2

### INSTALLATION AND OPERATING INSTRUCTIONS

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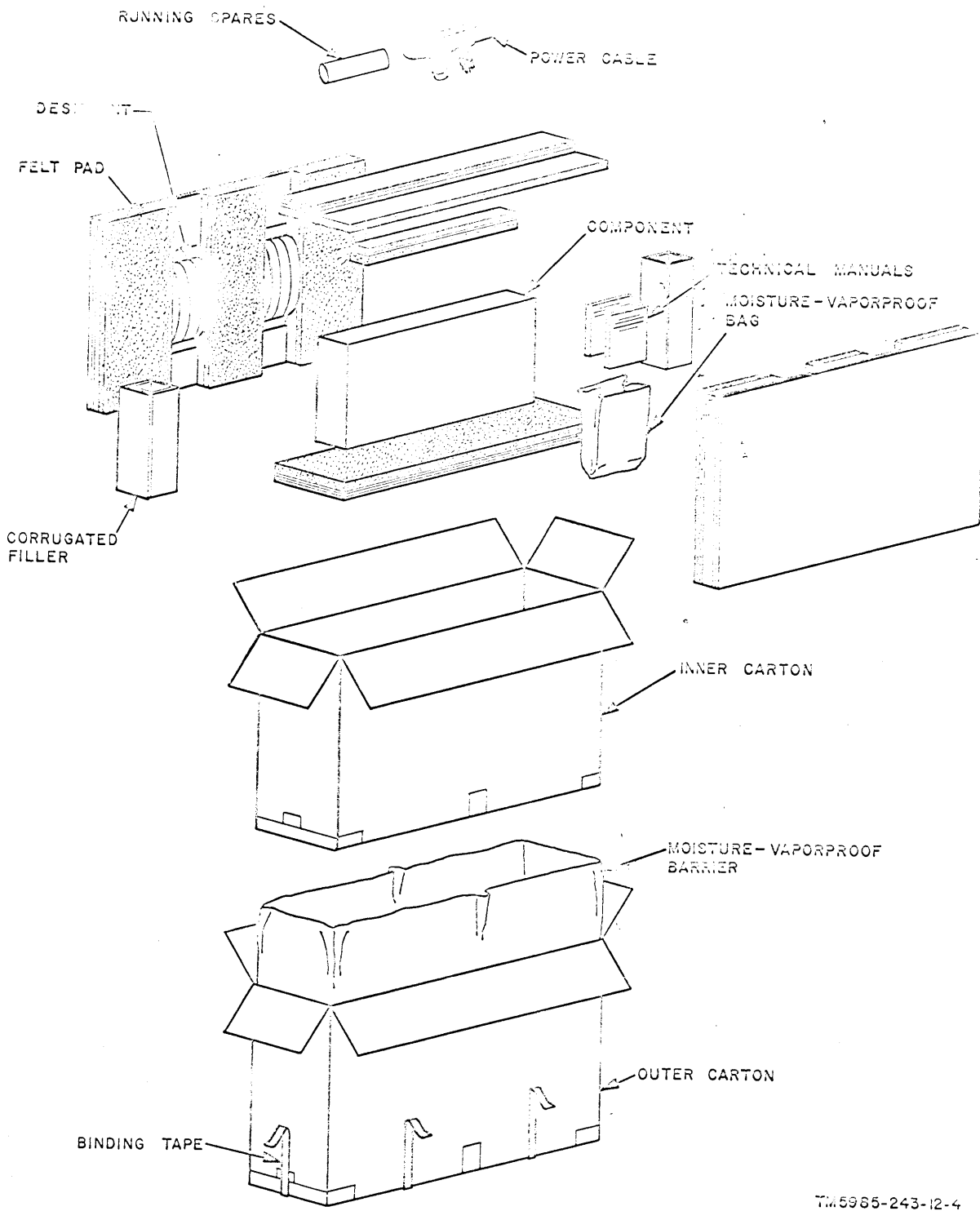
#### Section I. SERVICE UPON RECEIPT OF EQUIPMENT

##### 2-1. Unpacking

a. Packaging Data. When packed for shipment, the coupler is placed in a fiberboard carton and then in a moisture-vaporproof bag inside another fiberboard carton. A typical shipping container and its contents are shown in figure 2-1.

b. Removing Contents. Perform the procedures outlined below when unpacking the equipment.

- (1) Open the carton and the moisture-vaporproof barrier within the carton.
- (2) Remove the inner carton.
- (3) Open the inner carton and remove the contents.



## 2-2. Checking Unpacked Equipment

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

b. See that the equipment is complete as listed on the packing slip or in the table of components (para 1-6). Report all discrepancies in accordance with TM 38-750.

c. If the equipment has been used or reconditioned, see whether it has been changed by a modification work order (MWO). If the equipment has been modified, the MWO number will appear on the front panel near the nomenclature plate. See whether the MWO number and appropriate notations concerning the modification have been entered in the equipment manual.

Note: Current MWO's applicable to the equipment are listed in DA Pam 310-4.

## 2-3. Siting and Shelter Requirements

The coupler mounts in a standard 19-inch equipment rack and may be located any place that has an alternating-current(ac) primary power source available and keeps the equipment within the operating environmental limits given in paragraph 1-5.

## 2-4. Tools and Materials Required for Installation

The appropriate screws and a screwdriver are the only items needed for installation of the coupler.



2-5. Installation, Connections, and Adjustments of Coupler,

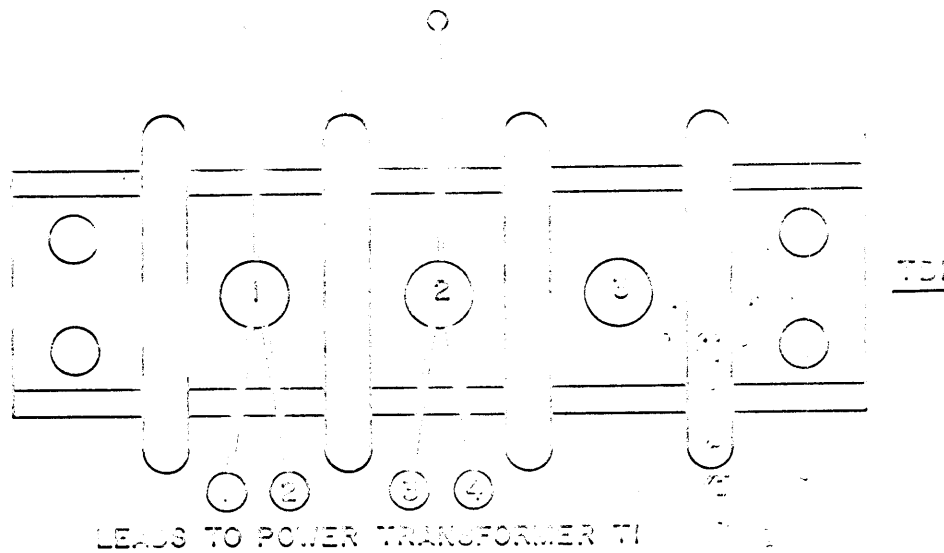
Antenna CU-1638/CR

Caution: Avoid installing the coupler near equipment that generates excessive heat.

a. Determine whether you have access to the rear of the rack mount assembly (not furnished as part of the equipment) after installation of the coupler. If not, perform the following procedures before mounting the coupler into the rack. (See note at the end of c below.)

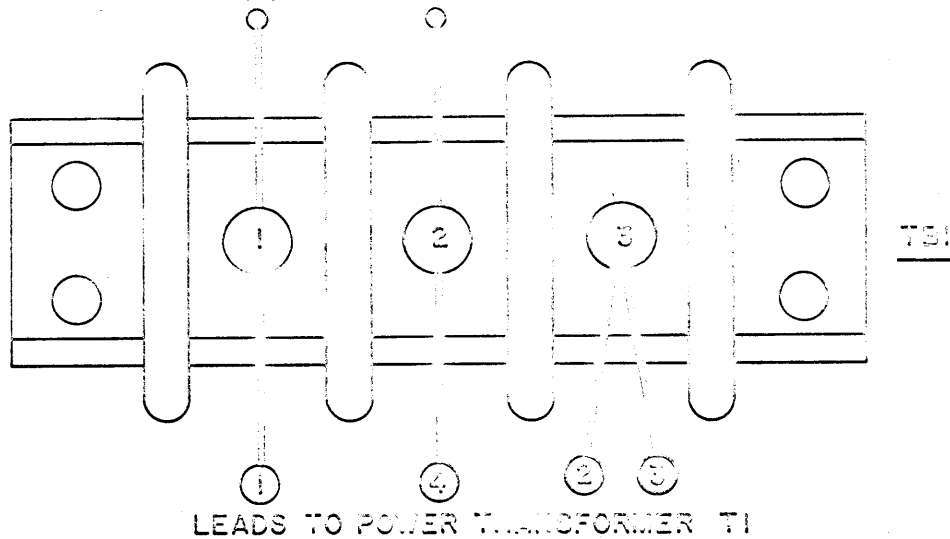
- (1) Insure that the front panel POWER switch (fig 1-1) is off.
- (2) Attach a coaxial cable from the antenna to input connector LJ7 on the rear panel of the coupler (fig 2-3).
- (3) Attach coaxial cables from the receivers to output connectors LJ1 through LJ6, on the back panel. Any one or all of these connectors may be in use at one time.
- (4) See that LTBI (fig 2-2) inside the coupler is wired properly for the primary source voltage (115 or 230 volts ac) to be used.

115-VOLTS AC FROM  
POWER SOURCE



A. 115-VOLT AC OPERATION

230-VOLTS AC FROM  
POWER SOURCE



B. 230-VOLT AC OPERATION

(5) Connect the power cord furnished with the equipment to L38 on the back panel and plug the other end to the primary power source.

(6) Mount the coupler in the rack with the tools and materials noted in paragraph 2-4.

b. If there is access to the rear of the rack assembly after mounting the coupler, perform the procedures given in (6) above first, and then perform a(1) through a(5).

c. There are no adjustments to be made on the coupler prior to operating it.

Note: For best operation of this equipment, connect all ground points on the back of the coupler together with heavy buss wire prior to installation.

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Section II. OPERATION UNDER USUAL CONDITIONS

Note: This section covers only items used by the operating items used by maintenance personnel are covered in instructions for the appropriate maintenance category.

2-6. Coupler, Antenna CU-1638/GR, Controls and Indicator

(fig 1-1).

Control or indicator	Function
POWER switch.....	Turns coupler on and off
TEST SWITCH.....	Selects output channel under test.
TEST METER.....	Indicates channel output level.

## 2-7. Starting and Operating Procedures

Caution: Be sure the coupler is wired for the available voltage (para 2-5a(4)).

a. Turn the POWER switch on.

b. Turn the TEST SWITCH to OFF. The coupler is now in operation.

No tuning is required by the operator to provide proper operation.

## 2-8. Stopping Procedure

Turning the POWER switch off deenergizes the coupler.

### Section III. OPERATION UNDER UNUSUAL CONDITIONS

#### 2-9. Desert and Dusty Areas

When operated in desert and dusty areas, large amounts of sand may enter the equipment. Try to keep the equipment as free of sand and dust as possible.

#### 2-10. Jungle and Tropical Areas

When the equipment is used in jungle or tropical areas, it may become covered with fungus growths because of the heat and high relative humidity. The high humidity causes moisture to collect on the equipment when the temperature of the equipment becomes lower than the surrounding air. Keep the equipment dry by wiping it with a dry cloth.

## CHAPTER 3

### OPERATOR'S MAINTENANCE INSTRUCTIONS

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#### 3-1. Scope of Operator's Maintenance

The maintenance duties assigned to the operator of the coupler are listed below, with references to the paragraphs covering the specific maintenance function. The duties assigned do not require special tools or test equipment.

a. Preventive maintenance checks and services (para 3-2 through 3-4).

b. Cleaning (para 3-5).

c. Repairs (para 3-6).

#### 3-2. Preventive Maintenance

Preventive maintenance is the systematic care, servicing, and inspection of equipment to prevent the occurrence of trouble, to reduce downtime, and to assure that the equipment is serviceable.

a. Systematic Care. The procedures given in paragraphs 3-4 and 3-5 cover routine systematic care and cleaning essential to the proper upkeep of the equipment.



b. Preventive Maintenance Checks and Services. The preventive maintenance checks and services chart (para 3-4) outlines the specific functions to be performed daily by the operator. These checks and services are to maintain Army electronic equipment in a combat-serviceable condition; that is, in good physical and in good operating condition. To assist operators in maintaining combat serviceability, the chart indicates what to check, how to check, and the normal conditions; the References column lists the illustrations, paragraphs, or manuals that contain supplementary information. If the defect cannot be remedied by the corrective action indicated, higher level maintenance or repair is required. Records and reports of these checks and services must be made in accordance with the requirement set forth in TM 38-750.

### 3-3. Preventive Maintenance Checks and Services Periods

Preventive maintenance checks and services of the coupler are required daily. Paragraph 3-4 specifies checks and services that must be accomplished daily or under special conditions listed below.

- a. When the equipment is initially installed.
- b. At least once each week if the equipment is maintained in a standby condition.
- c. When the equipment is reinstalled after being removed for any reason.

3-4. Operator's Daily Preventive Maintenance Checks and Services Chart

Sequence No.	Item to be Inspected	Procedure	References
1	Exterior surfaces .....	Clean all exterior surfaces .....	Para 3-5.
2	Switches .....	See that the mechanical action of each switch is smooth and is free of internal and external binding.	
3	Operation .....	Perform the operating procedures ..	Para 2-7.
4	TEST METER .....	See that TEST METER indicates in or above the operating (green) range when the TEST SWITCH is at any of the CHANNEL settings.	Higher level repair.

Note: Be sure to return the TEST SWITCH to OFF after checks are completed.

### 3-5. Cleaning

Inspect the exterior of the coupler. The exterior surfaces should be free of dirt, grease, and fungus.

- a. Remove loose dirt with a soft, clean cloth.

Warning: Prolonged breathing of Cleaning Compound is dangerous; make certain that adequate ventilation is provided. Cleaning Compound is flammable; do not use near a flame. Avoid contact with the skin; wash off any that spills on your hands.

- b. Remove grease, ground-in dirt from the case; use a cloth dampened (not wet) with Cleaning Compound (FSN 7930-395-9542).

- c. Remove dirt from jacks and receptacles with a brush.

- d. Clean the panel, meter, and control knobs with a soft, clean cloth. Use mild soap if necessary.

### 3-6. Repairs

- a. Replacement of Power On Lamp (fig. 1-1).

- (1) Turn the power on lamp and the lens assembly counterclockwise and remove them.
- (2) Pull the defective lamp from the lens assembly.
- (3) Insert a new lamp into the socket, and turn it clockwise.
- (4) To replace the lens assembly, turn it clockwise. Do not overtighten it, but be sure it is sufficiently tight.

b. Replacement of Fuses (fig. 1-1).

- (1) Depress the fuse cap, and at the same time, rotate it counterclockwise.
- (2) Remove the fuse and replace it with a new one. Make certain that the replacement is of the correct rating.
- (3) Replace the fuse cap.

## CHAPTER 4

### ORGANIZATIONAL MAINTENANCE INSTRUCTIONS

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#### 4-1. Scope of Organizational Maintenance

a. This chapter contains instructions covering organizational maintenance for the coupler.

b. Organizational maintenance consists of the following:

- (1) Preventive maintenance (para 4-4).
- (2) Touchup painting (para 4-5).
- (3) Troubleshooting (para 4-6).

#### 4-2. Tools and Test Equipment Required

Tool Kit, Radar and Radio Repairman TM-87/U is required for organizational maintenance. No test equipment is required.

#### 4-3. Quarterly Preventive Maintenance

Quarterly preventive maintenance checks and services of the coupler are required. Periodic daily services constitute a part of the quarterly preventive maintenance checks and services and must be performed concurrently. All deficiencies and shortcomings will be recorded in accordance with the requirements of TM 38-750. Perform all the checks and services listed in the organizational quarterly preventive maintenance checks and services chart (para 4-4) in the sequence listed.

**Warning:** Shut off the equipment before performing the above checks.

4-4. Organizational Quarterly Preventive Maintenance Checks and Services Chart

Sequence No.	Item to be inspected	Procedure	References
1	Completeness .....	See that the equipment is complete	Para 1-6.
2	Installation .....	See that the equipment is properly installed.	Para 2-5.
3	Cleanliness .....	See that the equipment is clean...	Para 3-5.
4	Preservation .....	Check all surfaces for evidence of fungus. Remove rust and corrosion and spot-paint bare spots.	Para 4-5.
5	Publications .....	See that all publications are complete, serviceable, and current.	DA Pam 310-4.
6	Modifications .....	Check DA Pam 310-4 determine if new applicable IMO's have been published. All urgent IMO's must be applied immediately. All remaining IMO's must be scheduled.	TM 38-750 and DA Pam 310-4.
7	Fuses .....	See that all operating fuses are of correct value. Check spare fuses for proper value and quantity.	

4-4. Organizational Quarterly Preventive Maintenance Checks and Services Chart ( )

Sequence No.	Item to be Inspected	Procedure	References
8	Mounting .....	See that all bolts, nuts, and washers are correctly positioned and properly tightened.	Para 2-5.
9	Knobs and switches .....	While making operating checks, observe that the mechanical action of each knob and switch is smooth and free of external or internal binding.	FIG 1-1.
10	TEST LIGHTER .....	See that TEST LIGHTER indicates in or above operating (green) range when TEST SWITCH is set to any of six CHANNEL settings.	
11	Spare parts .....	Check all spare parts for general condition and method of storage. There should be no evidence of overstock, and all shortages must be on valid requisites.	
12	Cables .....	See that all cables are tight.	

#### 4-5. Touchup Painting Instructions

When the finish on any metal parts of the equipment has been badly scarred, damaged, or corroded, lightly sand it with fine sandpaper. Use No. 000 Sandpaper and Cleaning Compound to clean the surface down to the bare metal. Refer to applicable cleaning and refinishing practices specified in IED SIC 304.

Warning: Prolonged breathing of Cleaning Compound is dangerous; make certain that adequate ventilation is provided. Cleaning Compound is flammable; do not use near a flame! Avoid contact with the skin; wash off any that spills on your hands.

#### 4-6. Troubleshooting Coupler Antenna CU-1638/CR

a. Power On Lamp. If the power on lamp does not light when the POWER switch is turned ON, check for the following:

- (1) Defective 1/4 AMP fuses (front panel).
- (2) Improper seating of LPS in LPS (fig. 2-3) or lack of primary power.

b. WEST MEYER Level. The WEST MEYER level should be in or above the operating (green) range area when the WEST SWITCH is turned to any one of the CHANNEL positions. If the level is below the green area, proceed as follows:



- (1) The TEST METER is calibrated to give an indication in the operating (green) range when the output of the channel under test is terminated into a 50-ohm load. Remove the coaxial line connector (from the receiver) for the channel or channels in question and check the TEST METER level. It should indicate slightly above the green area. If the indication is slightly above the green area, the trouble is not in the coupler, but in the coaxial line connected to it or the equipment associated with it.
- (2) If there is no indication in any position of the TEST SWITCH, higher maintenance level repair is required.

4-7. Troubleshooting Chart

Item No.	Trouble symptoms	Probable trouble	Corrective action
1	Power on lamp does not light when POWER switch is set to ON.	<p>a. Fuse F1 or F2 (Fig. 1-1) is defective.</p> <p>b. Power cable is loose or disconnected.</p>	<p>a. Replace defective fuse.</p> <p>b. Tighten power cable plug. Higher level repair required.</p>
2	TEST NUMBER indicates below green area only on certain settings of TEST SWITCH.	Loose or defective cables to receivers corresponding to switch settings exist.	Tighten associated cables. Higher level repair required.
3	TEST NUMBER indicates below green area on all settings of TEST SWITCH.	Loose or defective cable between antenna and coupler exists.	Tighten antenna cable. Higher level repair required.

## CHAPTER 5

### SHIPMENT AND LIMITED STORAGE AND DISCONNECTION TO PREVENT MILITARY USE

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#### Section I. SHIPMENT AND LIMITED STORAGE

##### 5-1. Disassembly of Equipment

Disassembly procedures for the coupler consist of the following:

- a. Disconnect the ac power cable from the primary power source.
- b. Disconnect the power cable from the coupler.
- c. Disconnect the input cable from the coupler.
- d. Disconnect output cables from the coupler.
- e. Remove the coupler from the rack mount assembly by removing the four screws from the front panel.

##### 5-2. Repackaging for Shipment or Limited Storage

The exact procedure for repackaging depends on the material available and the conditions under which the equipment is to be shipped or stored. Adapt the procedures outlined below whenever possible.

- a. Material Requirements. The following materials are required for packaging the coupler. For stock numbers of materials, consult SB 38-100.

a. Material Requirements (cont).

Material	Quantity
Waterproof paper	10 sq. ft.
Waterproof tape	10 ft.
Cotton twine	25 lb.
Corrugated cardboard	10 sq. ft.
Adhesive tape	10 ft.
Filler material	3 lbs.

b. Packaging.

(1) Cushion the coupler on all surfaces with pads of filter material. Place the cushioned unit within a wrap of corrugated cardboard. Secure the wrap with waterproof tape.

(2) Wrap the above package with waterproof paper and seal with waterproof tape.

c. Packing. Place the unit, wrapped as directed in b above, in a wooden box. Cushion the unit with filler material, to prevent movement of unit in box, before nailing top on the box.

Section III. DEMOLITION OF EQUIPMENT TO PREVENT FURTHER USE

5-3. Authority for Demolition

Demolition of the equipment will be accomplished only upon order of the commander. The destruction procedures outlined in paragraph 5-4 will be used to prevent further use of the equipment.

5-4. Methods of Destruction

Use any of the following methods to destroy the equipment.

a. Smash. Smash the controls, coils, switches, capacitors, transistors, transformers, and motor; use sledge, axes, handaxes, pickaxes, hammers, or crowbars.

b. Cut. Cut the power cable and all cables in the coupler; use axes, handaxes, or machetes.

Warning: Be extremely careful with explosives and incendiary devices. Use these items only when the need is urgent.

c. Burn. Burn cables and technical manuals; use gasoline, kerosene, oil, flamethrowers, or incendiary grenades.

d. Bend. Bend panel and cabinet.

e. Explode. If explosives are necessary, use firearms, grenades, or TNT.

f. Dispose. Bury or scatter the destroyed parts in slit trenches or foxholes or throw them into streams.

APPENDIX

REFERENCES

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Following is a list of applicable references available to the operator and organizational maintenance department of Company, Antenna CU-1636/GR:

- |              |   |
|--------------|---|
| DA Pam 310-4 | Index of Technical Manuals, Technical Bulletins, Supply Manuals (Types 7, 8, and 9), Supply Bulletins, Identification Orders, and Identification Work Orders. |
| SB 38-100    | Preservation, <u>packaging</u> , and Packing Materials, Supplies and Equipment Used by the Army.  |
| TD SIC 364   | Field Instructions for Packing and Preserving Electronic Command Equipment.   |
| TM 38-750    | Army Equipment Record Procedures.   |