

TM 11-5820-566-12

**OPERATING
AND
MAINTENANCE MANUAL**

FOR

**AMPLIFIER, RADIO FREQUENCY
AM-4306/GRC**

MANUFACTURED BY



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TM 11-5820-566-12

OPERATING AND MAINTENANCE MANUAL
FOR
AMPLIFIER, RADIO FREQUENCY AM-4306/GRC

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CAUTION

1. AMPLIFIER MUST BE USED WITH ANTENNAS SPECIFIED IN THIS MANUAL.
2. BANDSWITCH ON AMPLIFIER MUST BE IN POSITION CORRESPONDING TO THE FREQUENCY OF SIGNAL BEING TRANSMITTED.
3. RF INPUT MUST NOT EXCEED 4 WATTS
4. AMPLIFIER MUST NOT BE USED IN EXCESS OF 9:1 RECEIVE TO TRANSMIT RATIO (18 MIN OFF, 2 MIN ON) UNLESS ADEQUATE FORCED AIR COOLING IS PROVIDED.
5. IF OPERATED FROM A POWER SOURCE OTHER THAN BA-801, THE INPUT VOLTAGE MUST NOT EXCEED +24V DC UNDER ANY TRANSIENT OR STEADY-STATE CONDITION, AND ADEQUATE FORCED AIR COOLING MUST BE PROVIDED. (TERMINAL A: GROUND, B: +24VOLTS, C: NO CONNECTION).

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CHAPTER 1

INTRODUCTION

Section I. General

1-1. Scope

a. This manual describes the Amplifier, Radio Frequency AM-4306/GRC (fig. 1-1), and covers its installation, operation, and maintenance. It includes normal operating procedures, and instructions for operational checks, testing, and operator's and organizational maintenance.

b. Operator's maintenance of the Amplifier, Radio Frequency AM-4306/GRC includes the following:

- (1) Preventive maintenance
- (2) Visual inspection
- (3) Testing of Battery, Dry BA-801()/PRC
- (4) Replacement of Battery, Dry BA-801()/PRC
- (5) Operational check

c. Organizational maintenance includes the procedures listed for the operator's maintenance plus replacement of some external parts.

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 your equipment. Department of the Army Pamphlet No. 310-4 is an index of current technical

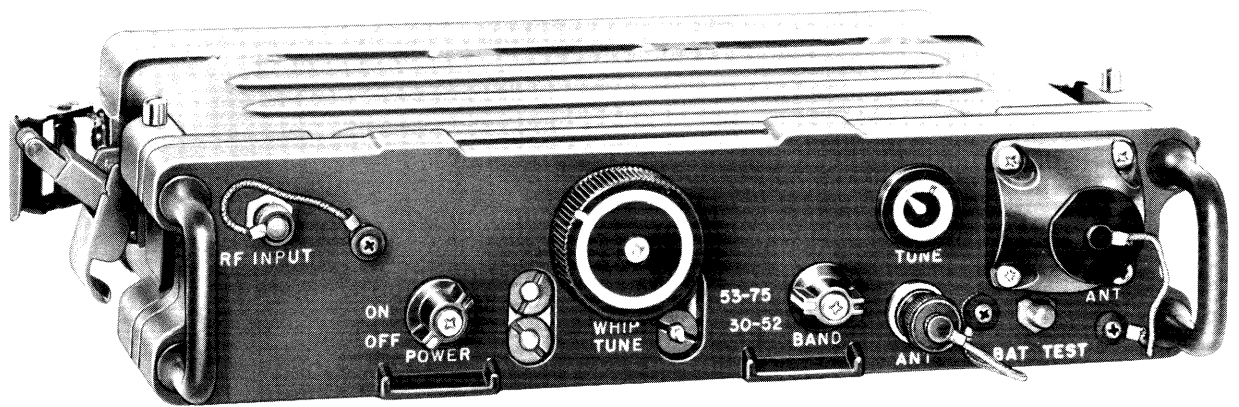


Figure 1-1. Amplifier, Radio Frequency AM-4306/GRC.

manuals, technical bulletins, supply bulletins, lubrication orders, and modification work orders that are 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. Reports 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 Publication 378 (Navy), and AFR 71-4 (Air Force).

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

Section II. DESCRIPTION AND DATA

1-4. Purpose and Use

a. The Amplifier, Radio Frequency AM-4306/GRC is a light-weight, compact radio frequency (rf) amplifier used with Receiver-Transmitter, Radio RT-505/PRC-25, part of man-pack Radio Set AN/PRC-25 (TM 11-5820-398-12); Receiver-Transmitter, Radio RT-841/PRC-77, part of Radio Set AN/PRC-77 (POMM 11-5820-667-35); and vehicular Radio Sets AN/VRC-53 and AN/GRC-125 (TM 11-5820-498-10). The AM-4306/GRC covers the frequency range of 30.00 to 75.95 MHz with a nominal power output of 25 watts. Throughout this manual receiver-transmitter refers to the RT-505/PRC-25 or the RT-841/PRC-77 unless otherwise specified.

b. The AM-4306/GRC is normally positioned under the receiver-transmitter. The AM-4306/GRC will accept the 3-foot or 10-foot whip antenna normally used with the man-pack radio; the AM-4306/GRC can be used also with a 50-ohm remote antenna, such as those used with the vehicular radios, Antenna AT-912/VRC, Antenna AS-1729/VRC and a fixed 50-ohm antenna such as Antenna Equipment RC-292 (TM 11-5020).

1-5. Technical Characteristics

Type	Solid-state rf amplifier for FM transmission.
Frequency range	30.00 - 75.95 MHz in two bands: Low band: 30.00 - 52.95 MHz High band: 53.00 - 75.95 MHz
OUTPUT POWER	3-foot or 10-foot whip antennas: 20 watts, nominal
Power supply requirements	24 vdc at 3.0 amps (nominal)
Input impedance	50-ohm resistive, nominal
Input rf power	1 to 4 watts from a receiver-transmitter
Types of antennas	3-foot or 10-foot whip antenna
Battery life	15 hours (with a 9 to 1 receive-transmit ratio)
Range	3-foot whip antenna: 10-12 miles 10-foot whip antenna: 18-24 miles

1-6. Description of Amplifier, Radio Frequency AM-4306/GRC

The AM-4306/GRC consists of one chassis on which all sub-assemblies are mounted. All of the operator controls are on the front panel. The antenna tuning indicator and all connectors except for the power source connector at the rear of the chassis, are on the front panel. The chassis is housed in

a watertight case and secured with four captive screws.

1-7. Additional Equipment Required for Man-Pack
Configuration (fig. 1-2)

The following equipment is required but the items are not components of the AM-4306/GRC.

a. Battery Pack. The battery pack consists of the following:

- (1) Battery, Dry BA-801()/PRC, which supplies 24 vdc nominal to the AM-4306/GRC, and also 3 vdc and 15 vdc to the receiver-transmitter. The battery is a non-rechargeable, dry-cell, zinc-carbon type.
- (2) Battery Box, CY-4612/GRC, which houses the BA-801 ()/PRC and secures it to the radio set. In the normal configuration, the CY-4612/GRC insures a watertight seal between the radio set and battery.
- (3) Adapter, Battery to Radio Set, which provides watertight sealing.

b. Antenna AT-892/PRC-25. The AT-892/PRC-25 is a one-section, 3-foot whip antenna used for general short-range service. It is made of steel tape and folds for small-space storage.

c. Antenna AT-271A/PRC. The AT-271A/PRC is a six-section antenna used when greater range is required. Each section fits into the end of a wider section. Stainless steel, plastic covered cable or cord is threaded through the sections,

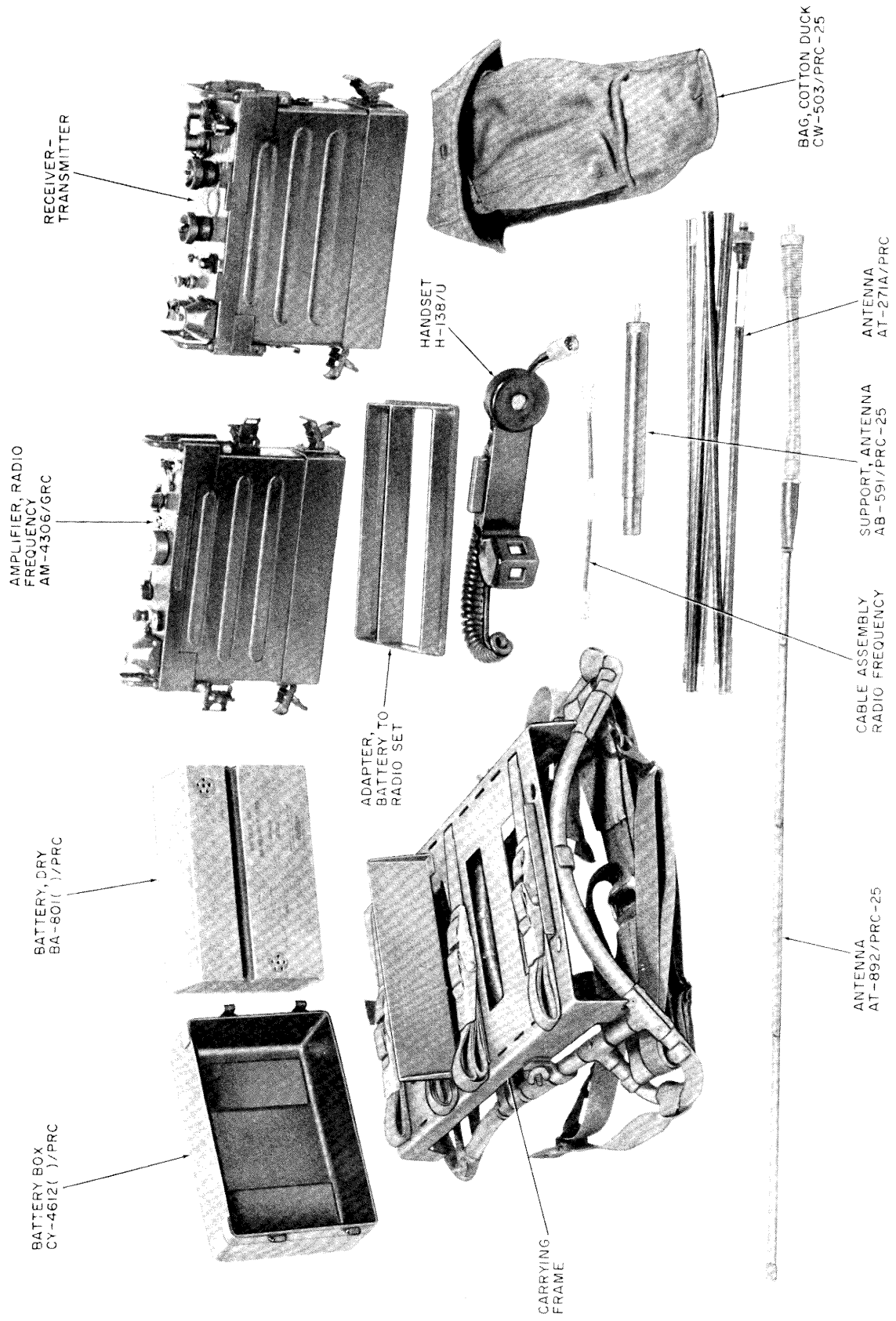


Figure 1-2. AM-4306/GRC and equipment used in man-pack operation.

under spring tension, to keep the sections together in the operating condition. When folded, the cable keeps the sections together to prevent loss of any section.

d. Support, Antenna AB-591/PRC. The AB-591/PRC is the rigid, tubular main support for the AT-271A/PRC.

e. Carrying Frame. The carrying frame secures the AM-4306/GRC receiver-transmitter combination, so that it can be carried on a man's back. It is made of aluminum alloy tubing and 1-inch nylon webbing straps.

f. Bag, Cotton Duck CW-503/PRC-25. The CW-503/PRC-25 is sectionalized into several pockets that store the two antennas, the antenna support, and the Handset H-138/U.

g. Handset H-138/U. The H-138/U, when connected to the receiver-transmitter, activates the AM-4306/GRC in the transmit mode through the receiver-transmitter.

1-8. Description of the Cable used with the AM-4306/GRC.

The rf cable assembly (fig. 1-2) is connected between the receiver-transmitter remote ANT connector and the AM-4306/GRC RF INPUT connector. The cable assembly consists of 7-1/4 inches of RG-58C/U cabling, connector UG-1366A/U, and connector UG-88C/U.

b. If the equipment has been used or reconditioned, check 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. Check whether the MWO number (if any) and the appropriate notations concerning the modifications have been entered in the equipment manual.

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

CHAPTER 2
INSTALLATION

Section I. SERVICE ON RECEIPT OF EQUIPMENT

2-1. Unpacking

a. Packaging Data. The AM-4306/GRC and associated components are packaged in two cartons and then packed in one larger carton (fig. 2-1). The instruction manuals are packaged separately. The total weight is approximately 15 pounds. When unpacking, if possible, retain the shipping carton, barrier bag, and filler pads for possible reuse in repackaging for shipment or limited storage.

b. Removing Contents. Because of the nature of the packaging of the AM-4306/GRC, no special instructions are required except that careful attention must be exercised when handling the equipment to prevent unnecessary damage.

2-2. Checking Unpacked Equipment

a. Check whether the shipment is complete as itemized on the packing list. Inspect the equipment for damage incurred during shipment. If the equipment is incomplete or damaged, report the discrepancy on DD Form 6 (para 3b). Shortage of a minor part that does not affect the proper functioning of the shipment should not prevent use of the equipment.

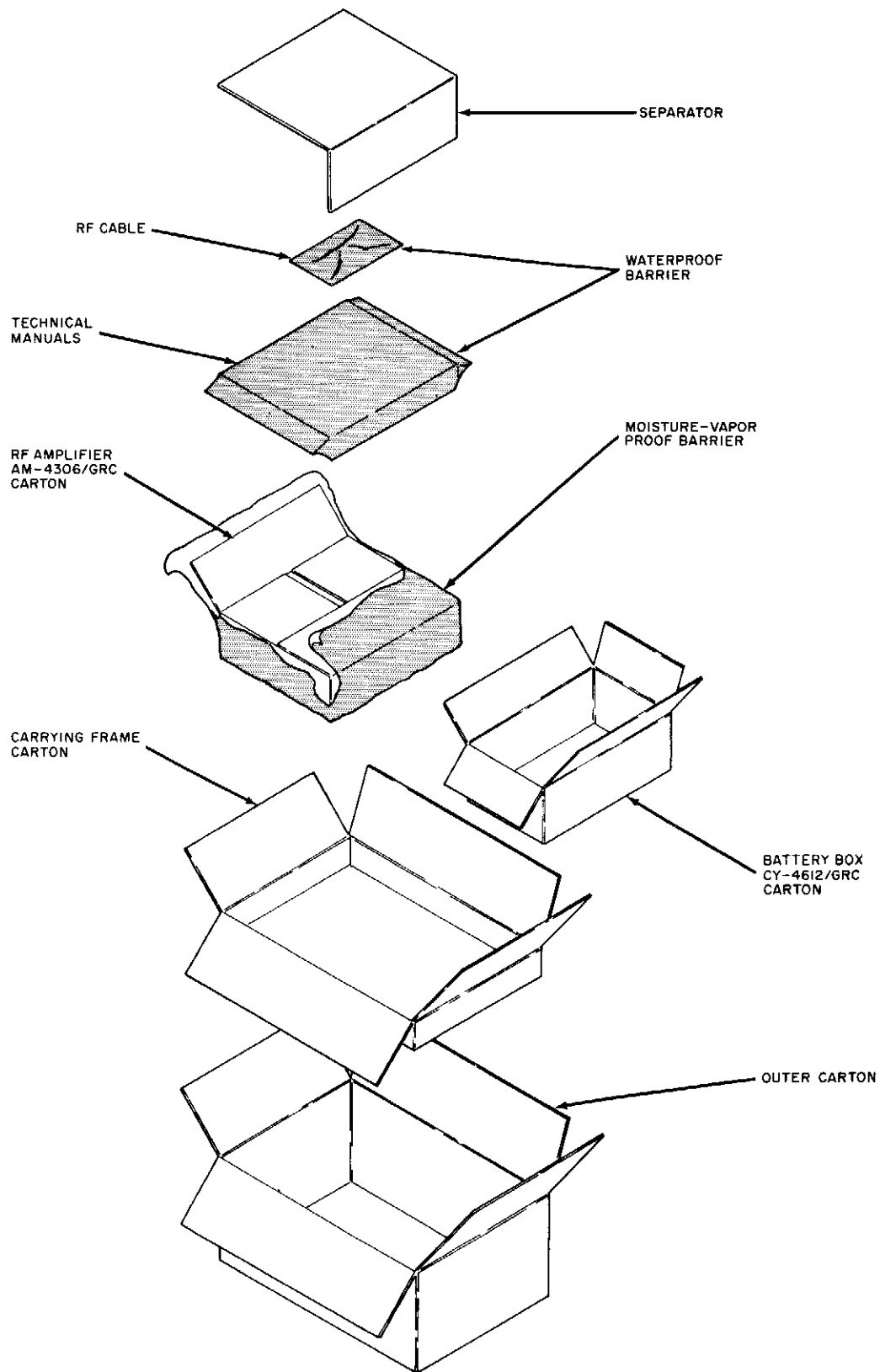


Figure 2-1. AM-4306/GRC packaging.

Section II. INSTALLATION OF EQUIPMENT

2-3. Assembly and Installation for Man-Pack Operation

For man-pack operation, use the following procedure to install the equipment. No tools are required.

a. Remove the battery from the receiver-transmitter. Store the battery box of the receiver-transmitter; it will be required when the receiver-transmitter is dissociated from the AM-4306/GRC.

b. Install the Battery, Dry BA-801()/PRC and the Battery Box, CY-4612/GRC as follows: (fig. 2-2)

- (1) Place the receiver-transmitter with the front panel downward resting on the handles and with the battery connector to your left.
- (2) Install the Adapter, Battery to Radio Set with the AM-4306/GRC section towards you.
- (3) Position the receiver-transmitter battery connector on the BA-801()/PRC in the center of the hole in the battery carton.
- (4) Lift the battery up and grasp it underneath with one hand; turn it over and lower gently in position on the receiver-transmitter battery connector.

Note: It may be necessary to move the battery slightly from side to side to mate the connectors.

- (5) To be certain the battery is installed properly, gently try to lift up the battery and note a slight resistance to this movement; also, if the battery is in place properly, the adapter will obscure the battery channel (fig. 2-2).
- (6) Position the battery box over the battery and secure the two latches on the sides of the receiver-transmitter to it.
- (7) Turn the receiver-transmitter, now attached to the battery box, over and position it resting on the battery box with the AM-4306/GRC section towards you. Unlatch the two receiver-transmitter clamps.
- (8) Position the AM-4306/GRC connector on the battery in the center of the hole in the battery carton.
- (9) Lift the AM-4306/GRC with two hands, placing the index fingers along the sides holding the latches up and gently lower it onto the battery. At the same time, mate the pins of the AM-4306/GRC case with the corresponding holes in the receiver-transmitter case.

Note: It may be necessary to tilt the AM-4306/GRC and the receiver-transmitter slightly away from each other to align the pins. Insure that the side clamps on the amplifier case are clear of the receiver-transmitter.

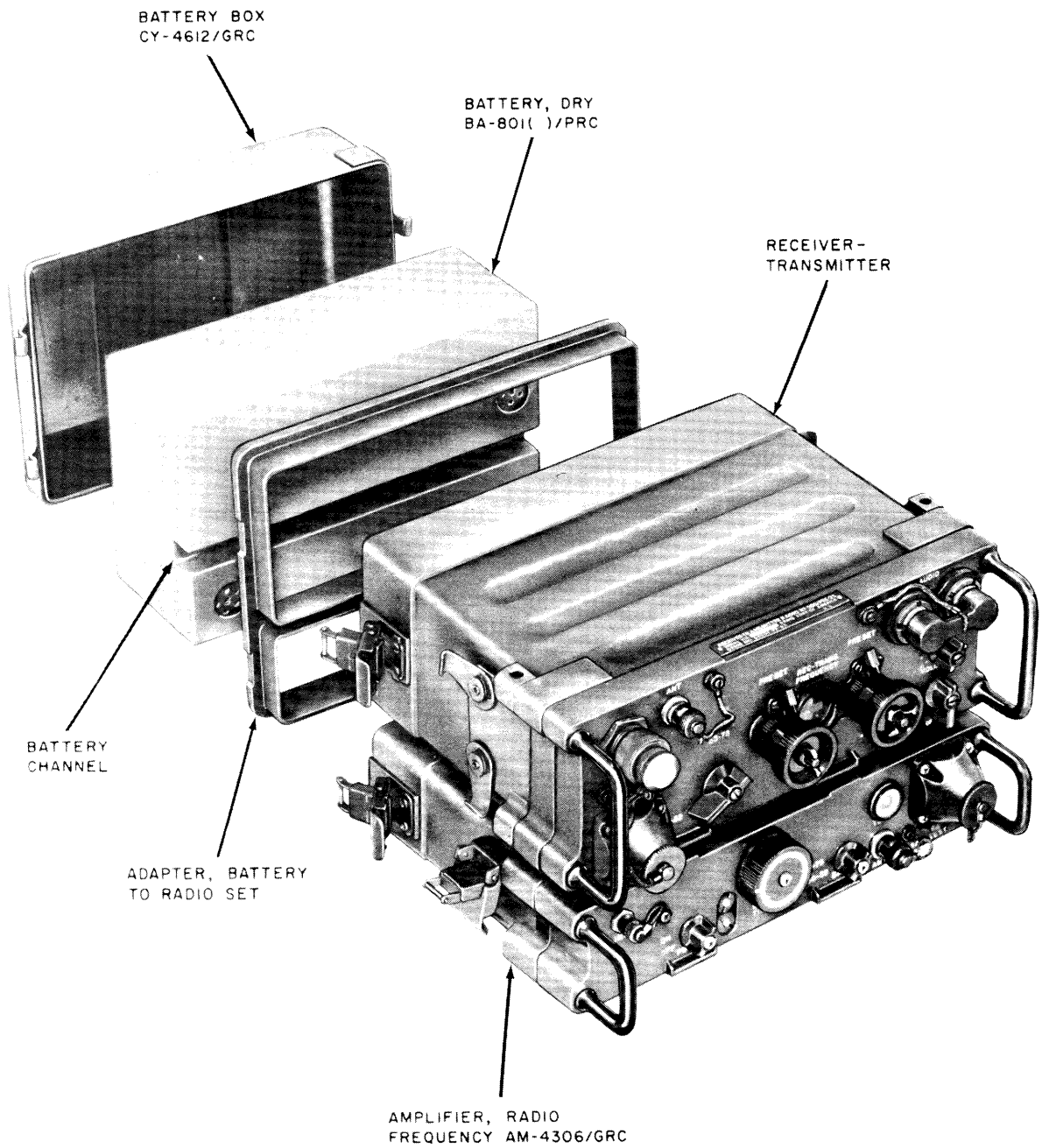


Figure 2-2. Battery, Dry BA-801()/PRC installation.

(10) Insure the AM-4306/GRC is mated properly with the battery by depressing the BAT TEST switch and observe the TUNE indicator for a deflection; also, the receiver-transmitter front panel should be flush with the AM-4306/GRC front panel.

(11) Secure the CY-4612/GRC to the AM-4306/GRC and receiver-transmitter with the clamps on the sides.

c. Install the RF Cable Assembly (fig. 2-3) by connecting it between the receiver-transmitter ANT connector and the AM-4306/GRC RF INPUT connector.

d. Attach the AM-4306/GRC receiver-transmitter combination to the carrying frame (fig. 2-4) as follows:

(1) Place the carrying frame on a flat, level surface with the braces facing upward.

(2) Place the AM-4306/GRC and receiver-transmitter combination on the carrying frame with the front panels toward the top.

(3) Fasten the AM-4306/GRC and receiver-transmitter combination to the carrying frame with the two retaining straps; feed the metal tipped straps through the retaining strap buckles and then through the end slot in the retaining strap buckles.

e. Install the antenna desired on the front panel of the AM-4306/GRC as follows:

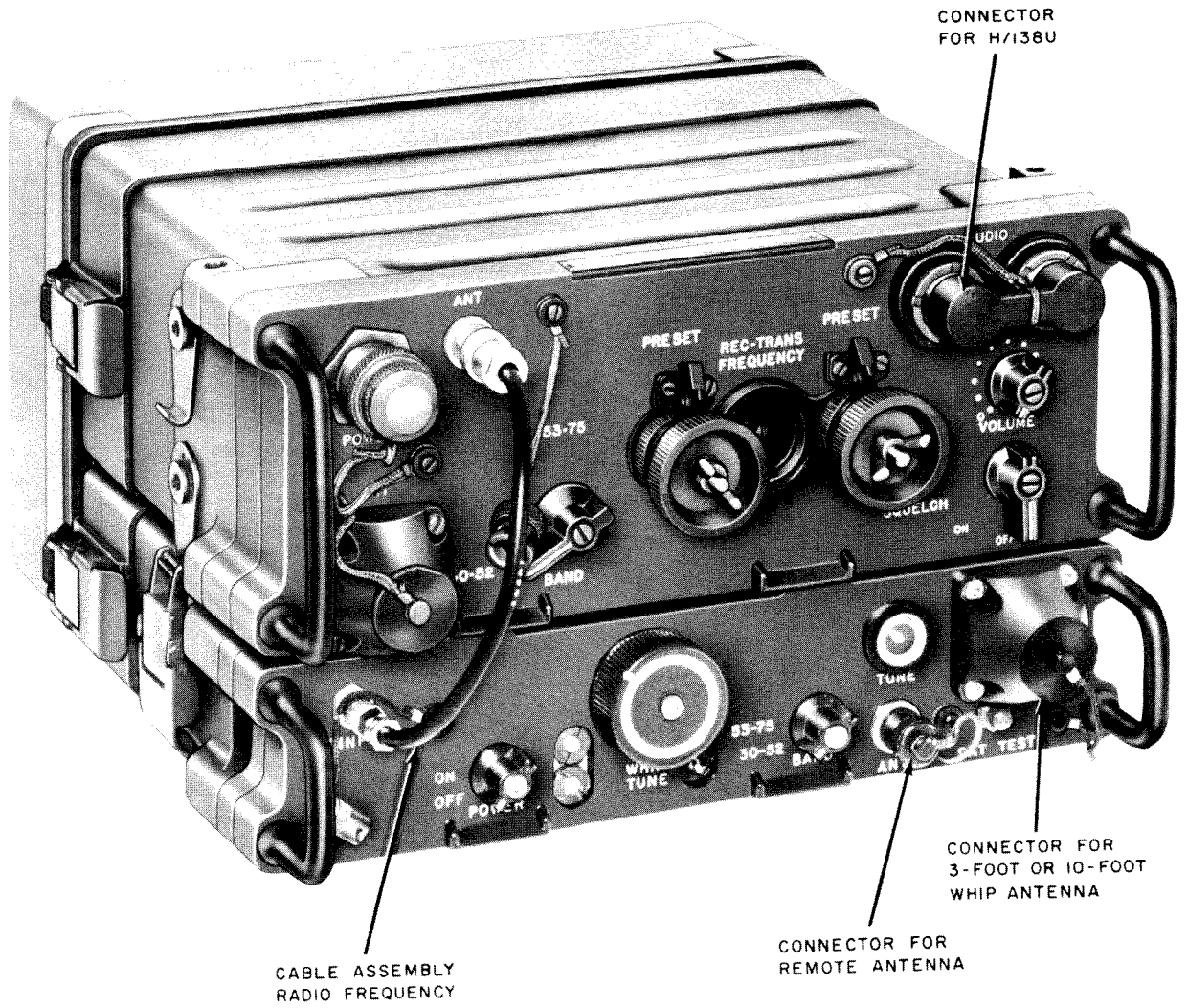


Figure 2-3. AM-4306/GRC Cabling diagram.

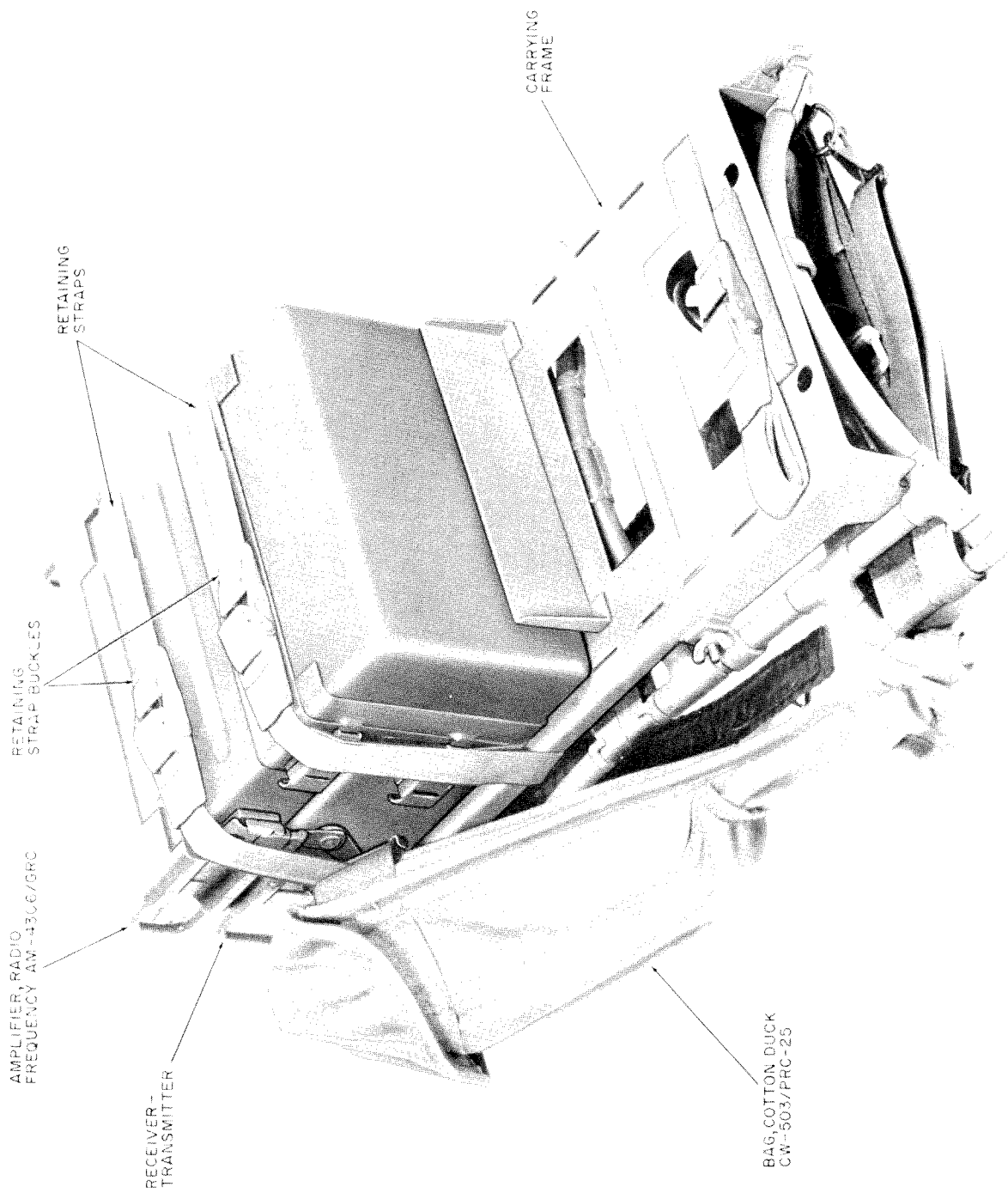


Figure 2-4. AM-4306/GRC and receiver-transmitter installed in carrying frame.

(1) Antenna AT-892/PRC

- (a) Remove the cover from the ANT mount.
- (b) Screw the bottom of the AT-892/PRC into the ANT mount.

(2) Antenna AT-271A/PRC

- (a) Remove the cover from the ANT mount.
- (b) Screw Support, Antenna AB-591/PRC-25 into the ANT mount.
- (c) Extend the AT-271A/PRC.
- (d) Screw the extended AT-271A/PRC into the AB-591/PRC-25.

f. Connect the H-138/U to the receiver-transmitter.

g. Mount the carrying frame on the man as follows:

- (1) Place the carrying frame, with the radio set attached, on the man's back with the shoulder straps over his shoulders.
- (2) Feed metal-tipped end of the lower left strap through the left shoulder strap ring. Feed the metal tip through the center slot of the left shoulder strap buckle and then down through the end slot.
- (3) Feed the metal-tipped end of the lower right strap through the right shoulder strap ring. Feed the metal tip through the center slot of the right

shoulder strap buckle and then down through the end
slot

- (4) Hook the two belt straps to the combat belt.

CHAPTER 3

OPERATING INSTRUCTIONS

3-1. Controls, Indicator, and Connectors

(fig. 3-1)

Explanation of controls, indicator, and connectors follows:

Control, indicator, or
connector

Function

RF INPUT connector

Provides connection for rf cable
from the receiver-transmitter.

POWER switch

Sw
Position

Action

OFF Deactivates the amplifying
 section of the AM-4306/GRC
 allowing the directional
 wattmeter and antenna
 matching network to oper-
 ate. This permits pas-
 sage of signals between
 the receiver-transmitter
 and the antenna without
 amplification.

ON Activates AM-4306/GRC for
 normal operation to am-
 plify transmitted sig-
 nals.

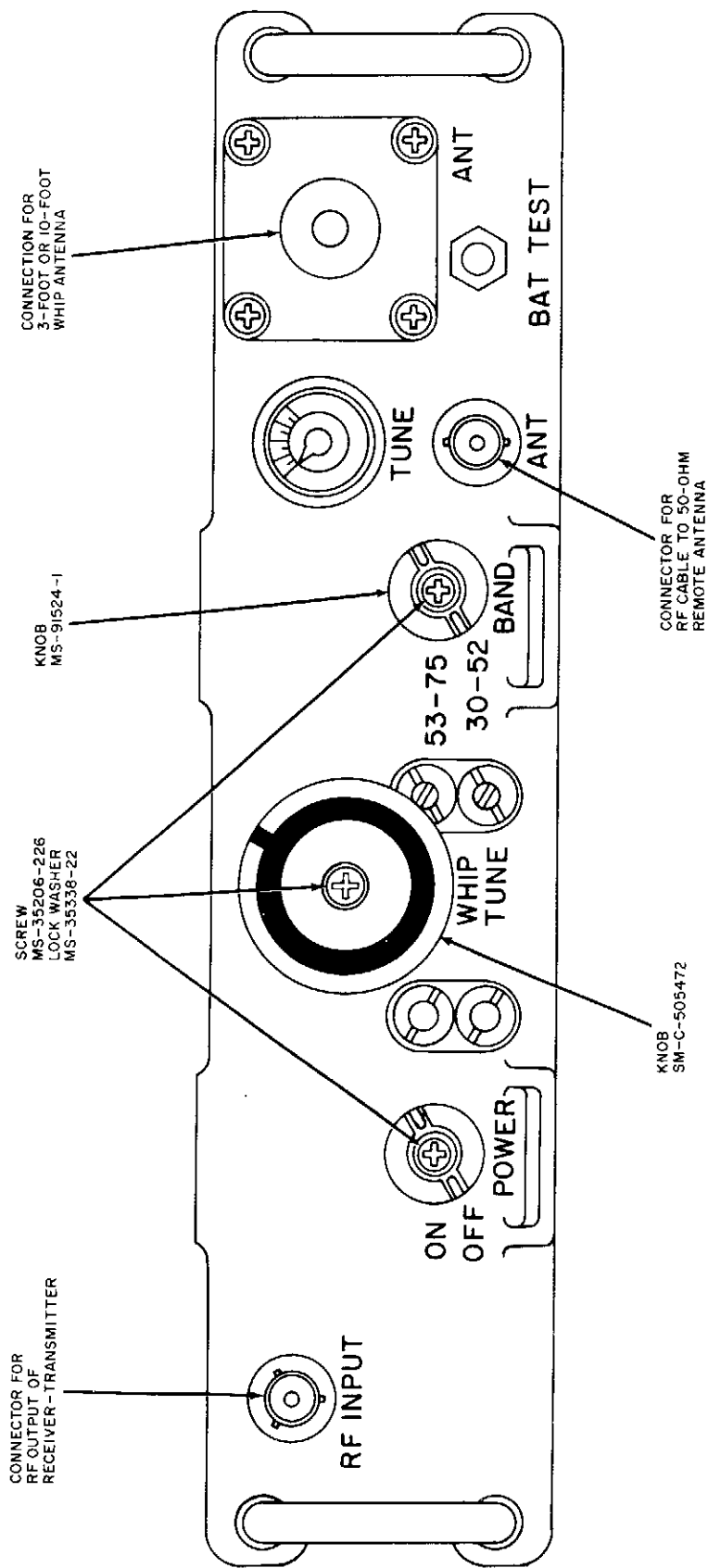


Figure 3-1. AM-4306/GRC controls, indicators, and connectors.

Control, indicator,
or connector (cont)

Function (cont)

WHIP TUNE control

Tunes the amplifier to insure efficient power transfer from the amplifier to the whip antenna.

BAND switch

Provides switching for the low pass filters to the proper frequency.

<u>Sw</u> <u>Position</u>	<u>Action</u>
30-52	Selects low frequency band
53-75	Selects high frequency band

TUNE indicator

a. Aids in tuning.
b. Indicates condition of battery when the BAT TEST switch is depressed.

BAT TEST switch

When switch is depressed, the TUNE indicator shows the condition of the battery.

ANT connector

Allows cable connection for use of a 50-ohm remote antenna (vehicular).

ANT mount and connector

Provides mounting and connection for the 3-foot or 10-foot antennas, AT-892/PRC and AT-271A/PRC.

Section II. OPERATION OF AMPLIFIER, RADIO FREQUENCY

AM-4306/GRC UNDER USUAL CONDITIONS

WARNING: DO NOT TOUCH THE ANTENNA WHEN TRANSMITTING!!

WHEN THE AM-4306/GRC IS TURNED ON AND RECEIVER-TRANSMITTER IS IN TRANSMIT MODE (VOICE TRANSMITTING), DANGEROUS VOLTAGES MAY EXIST AT THE ANTENNA.

3-2. Types of Operation

The AM-4306/GRC, when used with a receiver-transmitter, is capable of receiving or transmitting a modulated (FM) signal. It can operate in either a man-pack configuration or a vehicular configuration.

3-3. Operating Procedure for AM-4306/GRC in Man-Pack Configuration

Insure that a 3-foot or 10-foot whip antenna is installed (para 2-3e).

- a. Set the AM-4306/GRC POWER switch to the OFF position.
- b. Set the AM-4306/GRC BAND switch, 30-52 or 53-75, to correspond to the BAND switch position of the receiver-transmitter.
- c. Adjust the AM-4306/GRC WHIP TUNE control as follows:
 - (1) Turn the WHIP TUNE control knob fully clockwise.
 - (2) Preset the WHIP TUNE control by turning the knob counterclockwise the number of turns indicated in the following chart, depending on the frequency

and antenna.

Counterclockwise Turns on WHIP TUNE Control Knob

Frequency MHz	With 3-foot whip antenna	With 10-foot whip antenna
30-36	22	22
36-40	18	18
40-50	15	18
50-60	11	12
60-76	11	12

- (3) Set the function switch of the receiver-transmitter to ON.
- (4) Press the H-138/U handset push-to-talk switch.
- (5) Turn WHIP TUNE control slowly clockwise to obtain a maximum peak of the needle on the TUNE indicator.

Note: When the operator's hand is removed from the vicinity of the WHIP TUNE control knob after tuning, the TUNE indicator reading may change slightly; this is caused by hand capacitance and does not affect the tuning results. A number of peaks will be observed when approaching and passing through the correct tuning point. Since some of the peaks may be the same; choose a maximum peak.

- (6) Release push-to-talk switch on the H-138/U.
- (7) Lock tuning knob without allowing it to move.

Note: To prolong battery life use a minimum of time to perform steps (8), (9), and (10).

(8) Set AM-4306/GRC POWER switch to ON.

(9) Press push-to-talk switch on the H-138/U.

(10) Do Not move whip tune control with AM-4306/GRC POWER switch on.

d. To shut down equipment, turn the AM-4306/GRC POWER switch to the OFF position.

Note: With the AM-4306/GRC shut down the receiver-transmitter still will function in both receive and transmit modes, if steps (1), (2), (3), (4), and (5) of C. above have been performed correctly. The transmit power will be reduced to that of the receiver-transmitter.

CHAPTER 4

OPERATOR'S MAINTENANCE INSTRUCTIONS

4-1. Scope of Operator's Maintenance

The maintenance duties assigned to the operator of the Amplifier, Radio Frequency AM-4306/GRC are listed below and are discussed in paragraphs 4-2 through 4-9. These paragraphs reference the specific maintenance functions. Duties assigned do not require tools or test equipment.

- a. Preventive maintenance.
- b. Visual inspection.
- c. Testing of Battery, Dry BA-801()/PRC.
- d. Replacement of Battery, Dry BA-801()/PRC.

4-2. Preventive Maintenance

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

a. Systematic Care. The procedures given in paragraphs 4-4 through 4-6 cover the operator's systematic care and cleaning that is essential for proper upkeep and operation of the AM-4306/GRC. For equipment in use, the cleaning operation (para 4-6) should be performed once a day. If the equipment is not used daily it should be cleaned before operation; once a week if it is kept in a standby condition.

The other checks and services must be performed before the equipment is placed in operation after a shutdown, during operation, or after it is turned off, as specified in the applicable paragraph.

b. Maintenance Checks and Services. The maintenance checks and service charts (para 4-4 and 4-5) outline functions to be made at specific intervals. These checks and services are made to determine whether the AM-4306/GRC is in good general (physical) condition and in good operating condition. To assist the operator in maintaining combat serviceability, the charts indicate what to check, how to check, and what the normal conditions are; the References column lists the paragraphs or figure that contain detailed information. If the defect cannot be remedied by the operator, a higher level of maintenance is required. Records of these checks and inspection must be made in accordance with TM 38-750.

4-3. Preventive Maintenance Checks and Services Periods

Preventive maintenance checks and services of the AM-4306/GRC are required on a daily and weekly basis.

a. Paragraph 4-4 specifies checks and services that must be performed daily and under the special conditions listed below.

- (1) Immediately before starting on a mission.
- (2) When the equipment is initially installed.

(3) When the equipment is reinstalled after removal for any reason.

(4) At least once each week if the equipment is maintained in standby condition.

b. Paragraph 4-5 specifies additional checks and services that must be performed once a week.

4-4. Daily Preventive Maintenance Checks and Services Chart

Item No.	Item	Procedure	References
1	Completeness	Equipment must be complete.	Appendix II.
2	Proper Installation	Check that installation is proper.	Para 2-3. Para 2-4.
3	Cleanliness	Radio set must be clean and dry, free of grease, dirt, and fungus.	Para 4-6.
4	Preservation	Painted surfaces must be free of bare spots, rust, and corrosion.	None.
5	Connectors	Check tightness of all connectors.	Fig. 2-2.
6	Controls	Check that controls work without binding and are tight on their shafts.	Fig. 3-1.
7	Operation	Perform item no. 8 through 16 for the equipment checklist procedure.	None.

4-4. Daily Preventive Maintenance Check and Services Chart
(cont)

Item No.	Item	Procedure	References
<p><u>Note:</u> Check the equipment performance of the receiver-transmitter before proceeding to check the AM-4306/GRC below. Refer to TM 11-5820-398-12 (para 5-7).</p>			
8	Preliminary	Install the desired antenna in the AM-4306/GRC antenna mount.	Para 2-3 <u>e</u> .
9	Preliminary	Connect H-138/U handset to the AUDIO connector on the	TM 11-5820-398-12
10	Preliminary	Set the VOLUME control on the receiver-transmitter at 5.	TM 11-5820-398-12
11	Preliminary	Set the function switch on the receiver-transmitter to ON.	TM 11-5820-398-12
12	Power source	Depress BAT TEST switch with no test signal. Check that TUNE indicator is within the green area of the scale.	Para 4-8. Para 2-3 <u>e</u> .
13	Receive operation (low band)	Set up a nearby receiver-transmitter (known to be good) to transmit a 42 MHz	Para 2-3 <u>c</u> . Para 3-3.

4-4. Daily Preventive Maintenance Checks and Services Chart
 (cont)

Item No.	Item	Procedure	References
13 (cont)	Receive operation (low band) (cont)	signal (if authorized) and tune the AM-4306/GRC and its associated receiver-transmitter to 42 MHz. Obtain a long voice test signal from the nearby receiver-transmitter. The test signal should be heard loud and clear.	
14	Transmit operation (low band)	Adjust nearby receiver-transmitter to receive a 42 MHz test signal from the AM-4306/GRC and its associated receiver-transmitter. The test signal should be heard loud and clear at the nearby receiver-transmitter.	Para 2-3 <u>c</u> . Para 2-3 <u>e</u> . Para 3-3 <u>c</u> .
15	Receive operation (high band)	Repeat item 10 above using 65 MHz.	Same as item 10 above.

4-4. Daily Preventive Maintenance Checks and Services Chart
(cont)

Item No.	Item	Procedure	References
16	Transmit operation (high band)	Repeat item 11 above using 65 MHz.	Same as item 11 above.

4-5. Weekly Preventive Maintenance Checks and Services Chart

Item No.	Item	Procedure	References
1	Battery	Check that Battery, Dry BA-801()/PRC is free from leakage, corrosion, and swelling.	Fig. 2-1.
2	Antenna	Inspect the antennas to be sure that they are free of damage, loose fit, and corrosion.	Fig. 1-4.
3	Rust	The equipment must be free of all rust and corrosion. If not, a higher level of maintenance is required.	None.

4-6. Cleaning

Inspect the exterior of the AM-4306/GRC to insure that the surfaces are clean, free of dust, grease, and fungus.

- a. Remove dust and loose dirt with a clean soft cloth.

Warning: Cleaning Compound is flammable and its fumes are toxic. Provide adequate ventilation. Do not use near a flame.

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

(FSN 7930-395-9542).

- c. Remove dust and dirt from the connectors.

- d. Clean the front panel, TUNE indicator, and control knobs; use a soft clean cloth. If dirt is difficult to remove, dampen the cloth with water; mild soap may be used for more effective cleaning.

4-7. Visual Inspection

- a. When the AM-4306/GRC fails to perform properly, turn off the power and make the following checks:

Caution: Do not check any item with power on.

- (1) Improper setting of the BAND switch (para 3-3b).
- (2) Disconnected or improperly connected cable (fig. 2-2).
- (3) Grounded or broken antenna.

b. If the above checks do not locate the trouble, proceed to the battery test (para 4-8).

4-8. Battery Test

Battery, Dry BA-801()/PRC powers both the receiver-transmitter and the AM-4306/GRC. To determine whether the battery can operate the AM-4306/GRC satisfactorily with the receiver-transmitter, both equipments must be turned on and be in the transmit mode. Obtaining the proper indication in step g. below, while not in the transmit mode, is no guarantee that the transmission at full power can be accomplished.

Note: Do not perform the battery test until 10 minutes after the last transmission; this will allow the battery to recover so the test indications will be correct.

- a. Set the function switch on the receiver-transmitter to ON.
- b. Set the receiver-transmitter and the AM-4306/GRC on the same operating frequency band.
- c. Tune the AM-4306/GRC (para 3-3).
- d. Turn the AM-4306/GRC POWER switch to ON.
- e. Press the push-to-talk switch on the handset connected to the receiver-transmitter.
- f. Depress the BAT TEST switch on the AM-4306/GRC.

g. Observe the TUNE indicator on the AM-4306/GRC; the reading should be within the green area of the scale on the indicator for the first three seconds. If the satisfactory indication is not obtained, replace the battery as detailed in paragraph 4-9.

4-9. Battery Replacement

a. Removal

- (1) Remove the radio set from the carrying frame.
- (2) Position the radio set so that it rests on the Battery Box CY-4612/GRC, and remove all cables and the antenna.
- (3) Release the latches holding the AM-4306/GRC and receiver-transmitter together. Now release the latches holding these units to the Battery Box CY-4612/GRC.
- (4) Lift the AM-4306/GRC up and away from the CY-4612/GRC. It may be necessary to tilt the AM-4306/GRC away from the receiver-transmitter slightly to disengage the mounting guide pins.
- (5) Secure the latches holding the CY-4612/GRC to the receiver-transmitter and position the receiver-transmitter so that it rests on its handles.
- (6) Release the latches securing the CY-4612/GRC to the receiver-transmitter and remove the CY-4612/GRC.

- (7) Grasp the Battery, Dry BA-801()/PRC firmly and lift it straight up and away from the receiver-transmitter.

b. Replacement

- (1) Position the receiver-transmitter battery connector on the new battery, BA-801()/PRC, in the center of the hole in the battery carton.
- (2) Grasp the battery firmly with one hand underneath it, turn it over, and lower it gently in position on the receiver-transmitter battery connector.

Note: It may be necessary to move the battery from side to side slightly to mate the connectors.

- (3) Be sure the BA-801()/PRC is mated properly by gently trying to lift it up and noting a resistance to an upward movement; also, if the BA-801()/PRC is in place properly, the adapter will obscure the battery channel (fig. 2-1).
- (4) Position the CY-4612/GRC over the BA-801()/PRC and fasten together with the two latches on the sides of the receiver-transmitter.
- (5) Turn the receiver-transmitter, now attached to the CY-4612/GRC, over and position so it rests on the CY-4612/GRC with the AM-4306/GRC section towards you.

- (6) Release the two latches securing the CY-4612/GRC to the receiver-transmitter.
- (7) Position the AM-4306/GRC battery connector in the center of the hole in the battery carton.
- (8) Lift the AM-4306/GRC with two hands with your index fingers along the sides holding the latches up and gently lower it onto the BA-801()/PRC. At the same time, engage the guide pins of the AM-4306/GRC case with the corresponding holes in the receiver-transmitter case.

Note: It may be necessary to move the AM-4306/GRC from side to side slightly to mate the connectors and to tilt it slightly away from the receiver-transmitter to engage the mounting guide pins.

- (9) Be sure the AM-4306/GRC is mated properly with the battery by depressing the AM-4306/GRC BAT TEST switch and observe the TUNE indicator for a deflection; also, the receiver-transmitter front panel should be flush with the AM-4306/GRC front panel.
- (10) Secure the CY-4612/GRC to the AM-4306/GRC and receiver-transmitter with the latches on the sides. Also fasten the AM-4306/GRC to the receiver-transmitter with the two mounting latches.

CHAPTER 5

ORGANIZATIONAL MAINTENANCE INSTRUCTIONS

Section I. GENERAL

5-1. Scope of Organizational Maintenance

Organizational maintenance of the Amplifier, Radio Frequency AM-4306/GRC consists of essentially the same functions as for operator maintenance. It includes:

- a. Preventive maintenance (para 5-3).
- b. Parts removal and replacement on the AM-4306/GRC (para 5-10).

5-2. Materials and Tools Required

Test equipment is not required for organizational maintenance. The following material and tools are required:

- a. Cleaning Compound (FSN 7930-395-9542).
- b. Cleaning cloths.
- c. Tool Kit TK-101/G.

Section II. PREVENTIVE MAINTENANCE

5-3. Preventive Maintenance

a. Preventive maintenance is the systematic care, inspection, and servicing of the equipment to maintain it in serviceable condition and to assure maximum operational capability. Preventive maintenance is the responsibility of all levels of maintenance concerned with the equipment. This includes inspection, testing, and replacement of parts that inspection and tests indicate would probably fail before the next scheduled periodic service. Preventive maintenance checks and services of the AM-4306/GRC at the organizational maintenance level are made at monthly and quarterly intervals unless otherwise directed by the commanding officer.

b. Maintenance forms and records to be used and maintained on this equipment are specified in TM 38-750.

5-4. Monthly Maintenance

Perform the maintenance functions indicated in the monthly preventive maintenance checks and service chart (para 5-5) once each month. A month is defined as approximately 30 calendar days of 8-hour-per-day operation. If the equipment is operated 16 hours a day, the monthly preventive maintenance checks and services should be performed at 15-day intervals. Equipment maintained in a standby (ready for immediate operation) condition must have monthly preventive maintenance

checks and services performed on it. Equipment in limited storage (requires service before operation) does not require monthly preventive maintenance.

5-5. Monthly Preventive Maintenance Checks and Services

Item No.	Item	Procedure	References
1	Cables	Check that the cables are free of cuts, kinks, breaks, and undue strain. If cuts or breaks are found in cable insulation, temporarily repair them by covering them with insulating tape.	Fig. 2-2.
2	Fraying	Inspect the canvas and nylon items. Make certain that they are free from excessive wear and fraying.	Fig. 1-4.

5-6. Quarterly Maintenance

Quarterly preventive maintenance checks and services on the AM-4306/GRC are required. Monthly services constitute a part of the quarterly preventive maintenance checks and services and must be performed concurrently. All deficiencies or shortcomings will be recorded in accordance with the requirements of TM 38-750. Perform all the checks and services

listed in the quarterly preventive maintenance checks and services chart (para 5-7) in the sequence listed.

5-7. Quarterly Preventive Maintenance Checks and Services

Item No.	Item	Procedure	References
1	Completeness	Check that equipment is complete.	Appendix II.
2	Installation	Check that equipment is properly installed.	Ch. 2.
3	Cleanliness	Inspect the amplifier. It must be clean and dry, free of grease, dirt, and fungus.	Para 4-6.
4	Preservation	Inspect all painted surfaces. They must be free of bare spots, rust, and corrosion.	TM 9-2857
5	Publications	Make certain that: <u>a.</u> The manual is complete and in useable condition. <u>b.</u> All changes pertaining to the equipment are available and complete.	<u>a.</u> Appendix I. <u>b.</u> DA PAM 310-4

5-7. Quarterly Preventive Maintenance Checks and Services
(cont)

Item No.	Item	Procedure	References
6	Modifications	Be certain that all URGENT MWO's have been completed and all ROUTINE MWO's have been scheduled.	TM 38-750 DA PAM 310-4
7	Rubber Strips (on bottom of amplifier and in adapter)	Check that rubber strips are free from defects. Reglue if loose.	None.
8	Battery	Inspect Battery, Dry BA-801()/PRC. It must be free of leakage, corrosion, and swelling. The battery is removed when the equipment is not in use for one or more days.	Fig. 2-1.
9	Operation	Perform items 7 through 16 of the daily preventive maintenance.	Para 4-4.

Section III. TROUBLESHOOTING

5-8. General

Troubleshooting of this equipment is based upon the operational check contained in the daily preventive maintenance checks and services chart. To troubleshoot the equipment, perform all functions starting with item number 7 in the daily preventive maintenance checks and services chart (para 4-4) and proceed through the items until an abnormal condition or result is observed. When an abnormal condition or result is observed, note the item number and turn to the corresponding item number in the troubleshooting chart (para 5-9). Perform the checks and corrective measures indicated in the troubleshooting chart. If the corrective measures indicated do not result in correction of the trouble, a higher level of maintenance is required.

5-9. Troubleshooting Chart

Item No.	Trouble symptoms	Probable trouble	Checks and corrective measures
12	<u>a.</u> TUNE indicator shows below green area on scale.	<u>a.</u> Battery is weak.	<u>a.</u> Perform battery test (para 4-8).
	<u>b.</u> TUNE indicator shows no deflection.	<u>b.</u> Battery installed improperly.	<u>b.</u> Check battery installation (para 2-3). If installation is correct, replace the battery (para 4-9).
13	Unable to receive a test signal in low band operation.	Improper switch positions.	Check switch positions in accordance with the operating procedure (para 3-1).
		Improperly installed or damaged cable or antenna.	Check cable and antenna for proper installation or damage.

5-9. Troubleshooting Chart (cont)

Item No.	Trouble symptoms	Probable trouble	Checks and corrective measures
13 (cont)		WHIP TUNE control improperly aligned.	Realign the WHIP TUNE control (para 3-1).
14	Unable to transmit a test signal in low band operation.	Improper switch positions.	Check switch positions in accordance with the operation procedure (para 3-1).
		Improperly installed or damaged cable or antenna.	Check cable and antenna for proper installation or damage.
		WHIP TUNE control improperly aligned.	Realign the WHIP TUNE control (para 3-1).
		Battery is not strong enough for transmission.	Replace the battery even though item 12 above is satisfactory.
15	Unable to receive signal in high band operation.	Same as item 13.	Same as item 13.

5-9. Troubleshooting Chart (cont)

Item No.	Trouble symptoms	Probable trouble	Checks and corrective measures
16	Unable to transmit a test signal in high band operation.	Same as item 14.	Same as item 14.

5-10. Parts Removal and Replacement

Repairs made to the AM-4306/GRC at the organizational level are limited to those items listed in Appendix III, Section II. The following is the procedure for replacement of some of the spare parts.

a. Removal of WHIP TUNE Control Knob

- (1) Remove the knob center screw.
- (2) Grasp knob and pull it straight off the shaft.

b. Replacement of WHIP TUNE Control Knob

- (1) Place the knob on the shaft, being sure that it slips all the way on.
- (2) Replace the knob center screw and tighten securely.

c. Removal of BAND Switch Knob

- (1) Observe the position of the switch indicator. (This is necessary to insure proper replacement position.)
- (2) Remove the knob center screw.
- (3) Grasp knob and pull it straight off the shaft.

d. Replacement of BAND Switch Knob

- (1) Recall the position of the knob in step (1) of preceding paragraph c. and place knob on the shaft with the indicator at that position.
- (2) Replace the knob center screw and tighten securely.

e. Removal of POWER Switch Knob

- (1) Place POWER switch in the OFF position.
- (2) Remove knob center screw.
- (3) Grasp knob and pull it straight off the shaft.

f. Replacement of POWER Switch Knob

- (1) Place the POWER switch knob on the shaft so the indicator portion is at the OFF position.
- (2) Replace the knob center screw and tighten securely.

g. Remove the front panel electrical connector covers by removing the screw that secures the attaching cord to the front panel. All three covers are removed this way.

h. The Screw, Seal (Part No. SM-B-505289) is located on the rear of the AM-4306/GRC case (fig. 5-1).

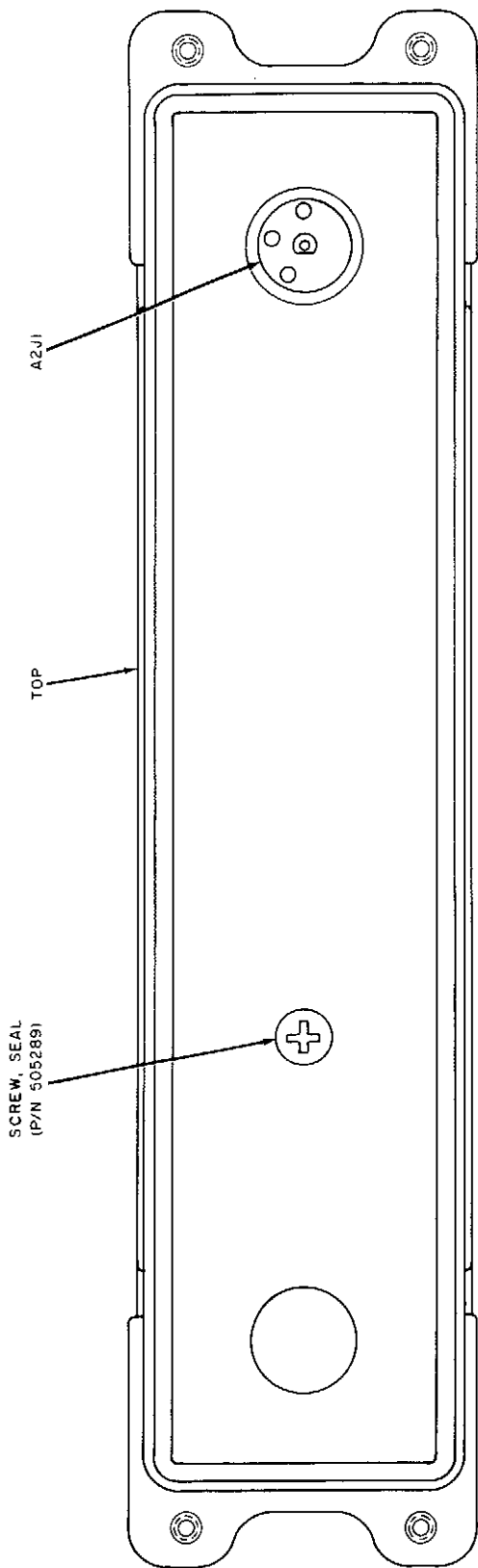


Figure 5-1. Screw, Seal location on the AM-4306/GRC case.

CHAPTER 6

SHIPMENT AND LIMITED STORAGE AND DEMOLITION
TO PREVENT ENEMY USE

Section I. SHIPMENT AND LIMITED STORAGE

6-1. Repackaging for Shipment or Limited Storage

The exact procedure for repackaging depends on the material available and the condition under which the equipment is to be shipped or stored. Adapt the procedures outlined below whenever possible. Use the original cartons, pads, and boxes, if available.

a. Material Requirements. The following materials are required for packaging the AM-4306/GRC and components. For stock numbers of materials, consult SB 38-100, Preservation, Packaging and Packing Materials, Supplies and Equipments Used in the Army.

Material	Quantity
Waterproof paper	35 square feet
Waterproof tape	10 feet
Corrugated cardboard	10 square feet
Pressure sensitive tape	8 feet
Filler material	2 pounds

b. Packaging. To prepare the equipment for shipment and limited storage, package it as follows:

(1) Cushion the AM-4306/GRC on all sides with pads of filler material.

- (2) Secure the pads to the AM-4306/GRC with pressure sensitive tape.
- (3) Place the cushioned package within a wrap of corrugated cardboard and secure the wrap with pressure sensitive tape.
- (4) Wrap the package with waterproof paper and seal with waterproof tape.
- (5) Wrap all components to be shipped or stored with the AM-4306/GRC in the same manner as outlined in steps (1) through (4).
- (6) Wrap the technical manual in waterproof paper and seal with waterproof tape.

c. Packing. Pack the AM-4306/GRC components and technical manual as follows:

- (1) Construct a wooden box large enough to allow 1-inch clearance on all sides.
- (2) Line the inside of the box with waterproof paper placing cardboard inside the paper.
- (3) Place the wrapped equipment in the box; put packing material around the wrapped packages to prevent movement inside the box.
- (4) With waterproof tape, seal the box liners around the packaged equipment.
- (5) Place the wrapped technical manual on top and then nail the top to the box.

Section II. DEMOLITION TO PREVENT ENEMY USE

6-2. Authority for Demolition

Demolition of the equipment will be accomplished only upon the order of the Commander. The destruction procedures outlined in paragraph 6-3 will be used to prevent further use of the equipment.

6-3. Methods of Destruction

Any of the methods of destruction given below may be used. The time available will be a major determining factor for the method used. The tactical situation will determine in what manner the destruction order will be carried out.

a. Smash. Smash the controls and associated components; use axes, sledge hammers, or anything heavy.

b. Cut. Cut the power and rf cable in several places; use axes, machetes, or any similar tool. If time permits, slash the interior wiring and cabling.

c. Burn. Burn as much of the equipment as is flammable (technical manuals, cables, etc.); use gasoline, oil, flame thrower, or similar flammables. Use incendiary grenades to complete destruction of the equipment interiors.

Warning: Be extremely careful with explosives and incendiary devices. Use these methods only when the need is an extreme emergency.

d. Explode. Use explosives to completely demolish or to cause maximum destruction when time does not permit demolition by other means.

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