

**TM 11-5820-767-12**

**DEPARTMENT OF THE ARMY TECHNICAL MANUAL**

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**OPERATOR AND  
ORGANIZATIONAL  
MAINTENANCE MANUAL**

**RADIO SET AN/URC-68**

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**HEADQUARTERS, DEPARTMENT OF THE ARMY**

**AUGUST 1968**

TECHNICAL MANUAL

No. 11-5820-767-12

HEADQUARTERS  
DEPARTMENT OF THE ARMY  
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**Operator and Organizational Maintenance Manual  
Radio Set AN/URC-68**

	Paragraph	Page
<b>CHAPTER 1. INTRODUCTION</b>		
Section I. General		
Scope -----	1-1	3
Indexes of publications -----	1-2	3
Forms and records -----	1-3	3
II. Description and Data		
Purpose and use -----	1-4	3
Technical characteristics -----	1-5	4
Description of Radio Set AN/URC-68 -----	1-6	5
Description of Parachute Adapter Kit MX-8197/URC-68 -----	1-7	5
<b>CHAPTER 2. INSTALLATION</b>		
Section I. Service Upon Receipt of Equipment		
General -----	2-1	7
Packaging data -----	2-2	7
Checking unpacked equipment -----	2-3	7
II. Installation Instructions		
General instructions -----	2-4	7
Initial checking and adjustment of equipment -----	2-5	10
Calculating crystal frequencies -----	2-6	11
Preparation for automatic parachute activation -----	2-7	11
<b>CHAPTER 3. OPERATION</b>		
Description -----	3-1	13
Controls and jacks -----	3-2	13
Modes of operation -----	3-3	14
Normal operating procedures -----	3-4	14
Beacon operation -----	3-5	15
Operational checks -----	3-6	15
Operational procedures -----	3-7	15
Stopping procedure -----	3-8	16
Recognition and identification of jamming -----	3-9	16
<b>CHAPTER 4. ORGANIZATIONAL MAINTENANCE</b>		
Section I. General		
Scope of organizational maintenance -----	4-1	17
Tools and materials required -----	4-2	17
II. Preventive Maintenance		
Organizational preventive maintenance -----	4-3	17
Preflight/daily preventive maintenance checks and services chart -----	4-4	17
Cleaning -----	4-5	18
Monthly preventive maintenance -----	4-6	18
Monthly preventive maintenance checks and services chart -----	4-7	18
III. Troubleshooting		
General troubleshooting procedures -----	4-8	19
Removal and replacement of battery -----	4-9	19

	Paragraph	Page
Battery life test -----	4-10	19
Fm transmitter RF power output test -----	4-11	19
Uhf transmitter RF power output test -----	4-12	20
<b>CHAPTER 5. SHIPMENT, LIMITED STORAGE, AND DEMOLITION</b>		
Section I. Shipment and Limited Storage		
General -----	5-1	21
Repackaging -----	5-2	21
II. Demolition to Prevent Enemy Use		
Authority for demolition -----	5-3	21
Methods of destruction -----	5-4	21
Reporting -----	5-5	21
<b>APPENDIX A. REFERENCES -----</b>		<b>23</b>
B. BASIC ISSUE ITEMS -----		<b>25</b>
C. MAINTENANCE ALLOCATION -----		<b>27</b>

# CHAPTER 1

## INTRODUCTION

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### Section I. GENERAL

#### 1-1. Scope

(fig. 1-1)

This manual describes Radio Set AN/URC-68. It includes instructions for operating, cleaning, and inspecting the equipment, and replacing parts available to the organizational maintenance repairman.

#### 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.* Use equipment forms and records in accordance with instructions given in TM 38-750.

*b. Report of Packaging and Handling Deficiencies.* Fill out and forward DD Form 6 (Report of Packaging and Handling Deficiencies) as prescribed in AR 700-58 (Army), NAVSUP Publication 378 (Navy), AFR 71-4 (Air Force), and MCO P4610-5 (Marine Corps).

*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 (Army), NAVSUP Publication 459 (Navy), AFM 75-34 (Air Force), and MCO P4610.19 (Marine Corps).

*d. Report of Equipment Manual Improvements.* Report of errors, omissions, and recommendations for improving this manual by the individual user is encouraged. Reports should be submitted on DA Form 2028 (Recommended Changes to DA Publications) and forwarded direct to Commanding General, U.S. Army Electronics Command, ATTN: AMSEL-ME-NMP-AD, Fort Monmouth, N. J., 07703.

### Section II. DESCRIPTION AND DATA

#### 1-4. Purpose and Use

(fig. 1-1)

*a. Purpose.* Radio Set AN/URC-68 is a compact, personal emergency transceiver that provides two-way, ground-to-ground and ground-to-air communications. The AN/URC-68 has four preset channels within the frequency-modulation (fm) band, and four preset channels within the ultrahigh frequency (uhf) band, all compatible with standard military communication equipment. Two guard frequen-

cies are provided, one each in the fm and uhf bands.

*b. Use.* Radio Set AN/URC-68 is used principally for air rescue operations and provides ground-to-ground and ground-to-air communications as follows:

(1) Normal voice communications between two stations.

(2) Beacon operation, transmitting an audio tone which is swept in frequency between approximately 1 kilohertz (kHz) to 300

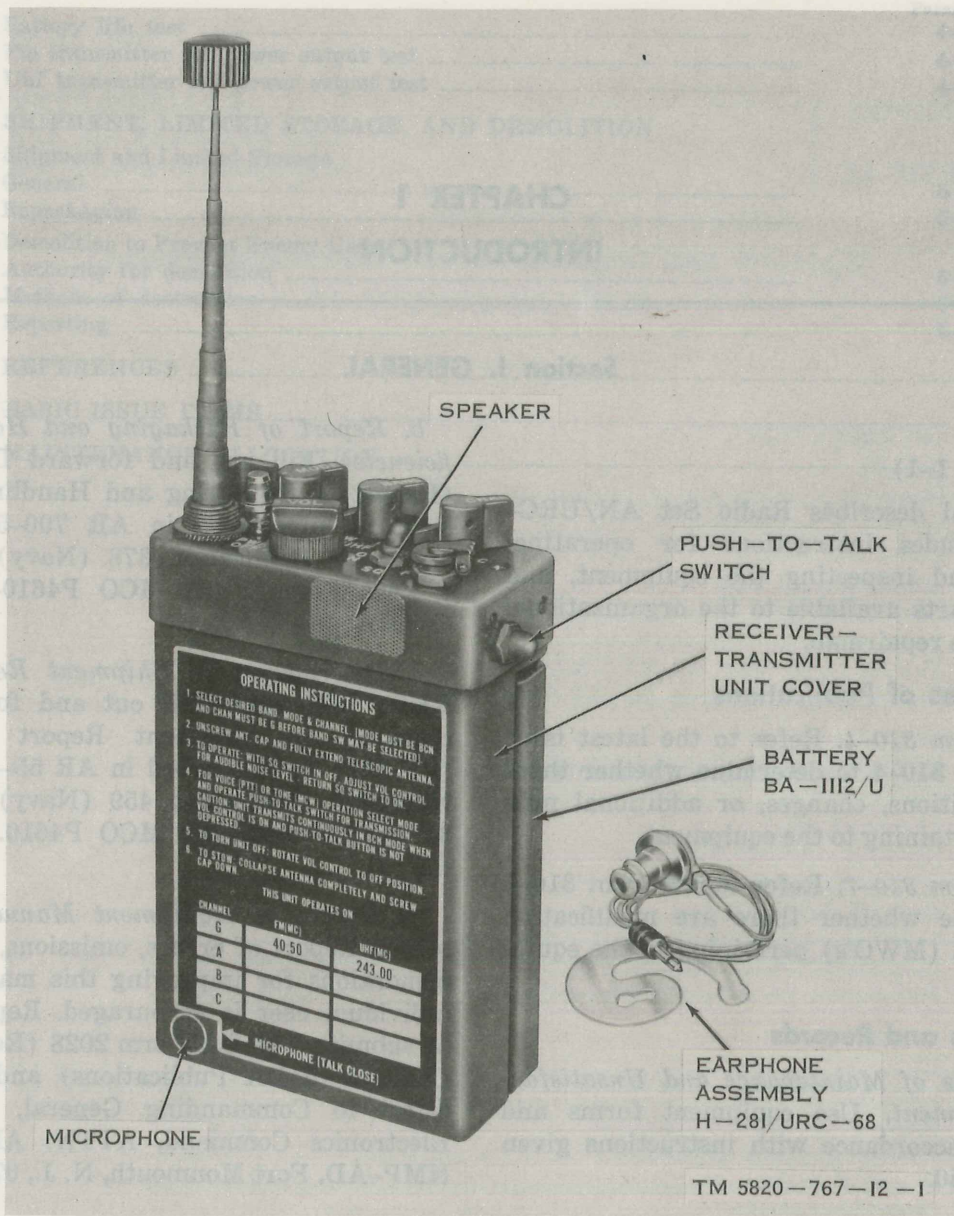


Figure 1-1. Radio Set AN/URC-68, less Parachute Adapter Kit MX-8179/URC-68.

Hertz (Hz) (beacon tone) at a rate of 1 to 1½ times per second.

(3) Transmission of a 1-kHz audio tone when operated in the modulated continuous wave (mcw) mode.

(4) Beacon operation, transmitting the beacon tone, switched alternately between the guard frequencies in the 40.5-megahertz (MHz) fm band and the 243.0-MHz uhf band.

(5) Additional use with a parachute adapter kit allows the radio set to operate automatically after parachute activation during

crewman aircraft ejection. The parachute adapter kit is necessary in fixed wing aircraft using ejection-type seats.

c. *Components.* The components of Radio Set AN/URC-68 are listed in the basic issue items list (app. B).

### 1-5. Technical Characteristics

a. *General.*

Frequency:

Fm ----- 38 to 42 MHz.

Uhf ----- 230 to 250 MHz.

Range ----- 20 miles.

Available channels:

Fm ----- 80.  
Uhf ----- 400.

Preset channels:

Fm ----- 4.  
Uhf ----- 4.

Channel spacing ----- 50 kHz.

Operating modes ----- Voice, mcw, and beacon.

Input voltage ----- 11 to 16 vdc.

Battery life ----- 18 hours in beacon mode.

Dimensions (with battery, less parachute adapter kit):

Height ----- 6 in.  
Width ----- 3 $\frac{3}{4}$  in.  
Depth ----- 1 $\frac{3}{4}$  in.  
Weight ----- 32 ounces.

*b. Transmitter.*

Power output:

Fm ----- 500 mw.  
Uhf ----- 200 mw.

Frequency control ----- Crystal.

Frequency stability:

Fm -----  $\pm 4.0$  kHz.  
Uhf -----  $\pm 12.0$  kHz.

Duty ----- Continuous transmission to 10,000 feet. Less than 3-db degradation over range of  $-40^{\circ}$  C to  $55^{\circ}$  C.

*c. Receiver.*

Signals received ----- Voice or tone.

Adjacent channel rejection ----- More than 40 db.

Image rejection ----- More than 40 db.

Sensitivity:

Fm -----  $1.0 \mu\text{V}$  for 10 db  $\frac{S+N}{N}$ .

Uhf -----  $5.0 \mu\text{V}$  for 10 db  $\frac{S+N}{N}$ .

Squelch sensitivity:

Fm -----  $1.0 \mu\text{V}$ .

Uhf -----  $5.0 \mu\text{V}$ .

Limiting ----- Less than 3-db audio change from 2 to 100K  $\mu\text{V}$ .

Age -----  $\pm 5$  db at 100 mv.  
0 db at 1,000 mv.  
 $\pm 5 \mu\text{V}$  at 5  $\mu\text{V}$ .

Audio output ----- 250 mw.

IF bandwidth ----- 6 db  $\pm 20$  kHz min;  
50 db  $\pm 50$  kHz max.

Volume control ----- Adjustable from 0 to 250 mw.

Distortion ----- 10% at 250-mw output.

Audio frequency response -----  $-6$  db 300 and 2,500 Hz. 0 db at 1,000 Hz.

Type of squelch ----- Carrier noise or tone.

**1-6. Description of Radio Set AN/URC-68**

The AN/URC-68, less the parachute adapter kit, comprises a receiver-transmitter unit, the receiver-transmitter unit cover, Battery BA-1112/U, and Earphone Assembly H-281/URC-68.

*a.* The receiver-transmitter unit, which consists of the removable assemblies and the interconnecting circuitry, is contained in a watertight, dusttight, plastic receiver-transmitter unit cover.

(1) A squelch disable switch, a band switch, a mode switch, a channel switch, a volume control, an external antenna connector, a telescopic antenna, and a phone jack are located on the front panel.

(2) A speaker and a microphone are located on the front of the receiver-transmitter unit, and a push-to-talk switch is located on the side of the receiver-transmitter unit.

*b.* The removable battery, which consists of ten 1.35-volt cells, is attached at the rear of the receiver-transmitter unit by a single, slotted, captive screw.

*c.* Earphone Assembly H-281/URC-68 (earphone) which consists of an earphone, an attaching wire with a connector on each end, and a plastic support, is part of the AN/URC-68.

**1-7. Description of Parachute Adapter Kit MX-8197/URC-68**

(fig. 1-2)

Parachute Adapter Kit MX-8197/URC-68 (parachute adapter kit) consists of a 3-foot

external wire antenna to be attached to a parachute shroud, and a parachute adapter with push-to-talk switch actuator and lanyard used to adapt the radio set for automatic

parachute activation. The parachute adapter kit is provided as part of the AN/URC-68 to those aircraft units that require automatic activation by parachute.

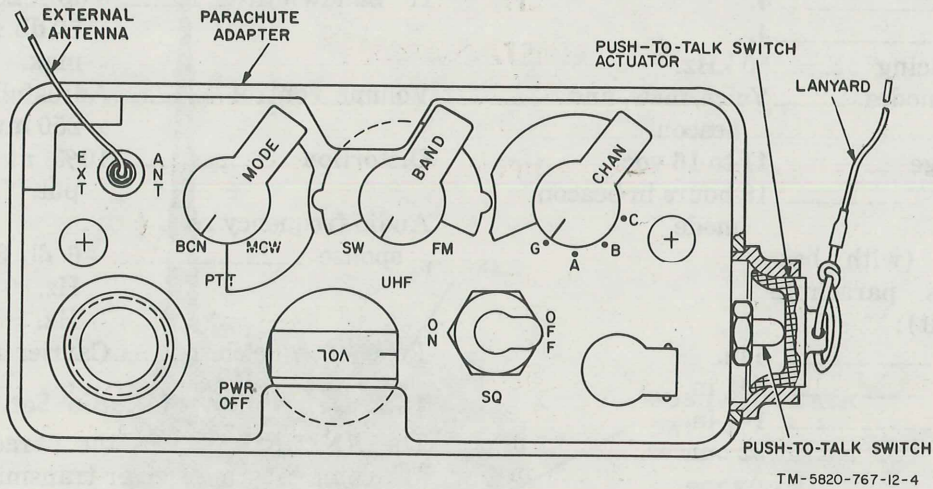


Figure 1-2. Radio set, parachute adapter kit attached.

## CHAPTER 2 INSTALLATION

### Section I. SERVICE UPON RECEIPT OF EQUIPMENT

#### 2-1. General

The AN/URC-68 is a handheld, simple-to-operate transceiver capable of transmitting beacon signals, or providing two-way voice or mcw communications, on any of its eight preset channels. It is normally used as an emergency communication device. No siting, shelter instructions, nor system planning procedures are necessary.

#### 2-2. Packaging Data

(figs. 2-1 and 2-2)

The AN/URC-68, less the parachute adapter kit, is packed in two cartons. One carton contains the receiver-transmitter unit, the technical manual, and the earphone (fig. 2-1). The other carton contains Battery BA-1112/U (fig. 2-2).

Carton contents	Number of cartons	Dimensions (in.)	Volume (cu in.)	Unit weight (lb)
Receiver-Transmitter Unit. Earphone Assembly H-281/URC-68. Technical manual.	1	11½ by 9 by 2½ -----	258.75	3
Battery BA-1112/U.	1	5 by 4 by 1¼ -----	25	1½

#### 2-3. Checking Unpacked Equipment

a. Inspect the equipment for damage that may have occurred during shipment. If the equipment has been damaged, fill out and forward DD Form 6 (para 1-3b).

b. Check to see that the equipment is complete as listed on the packing slip. If a packing slip is not available, check the equipment against the basic issue items list (app. B). Report all discrepancies in accordance with instructions given in TM 38-750. The equip-

ment 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. If the equipment has been modified, the MWO number will appear on the front panel near the nomenclature plate. Check to see whether all MWO's current at the time the equipment is placed in use have been applied.

*Note.* Current MWO's applicable to the equipment are listed in DA Pam 310-7.

### Section II. INSTALLATION INSTRUCTIONS

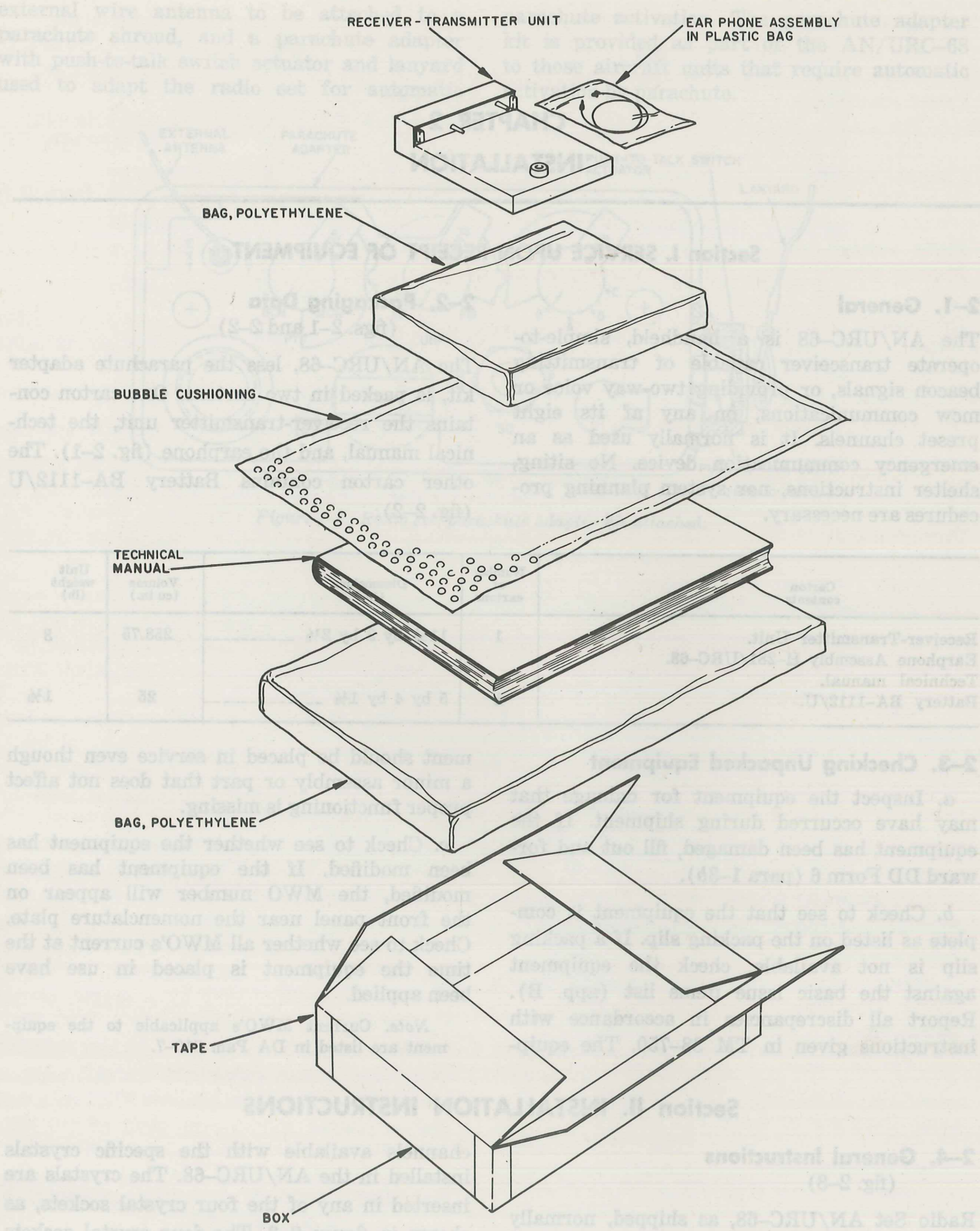
#### 2-4. General Instructions

(fig. 2-3)

Radio Set AN/URC-68, as shipped, normally includes three crystals. The installed crystals determine frequencies for six of the eight channels. The chart below indicates the preset

channels available with the specific crystals installed in the AN/URC-68. The crystals are inserted in any of the four crystal sockets, as shown in figure 2-3. The four crystal sockets are identified from top to bottom as G (guard), A, B, and C and provide four uhf

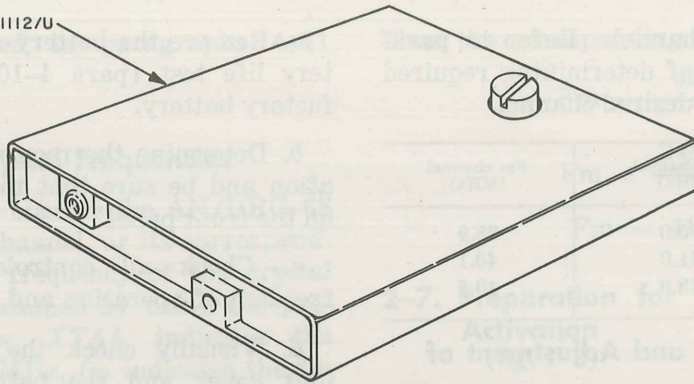




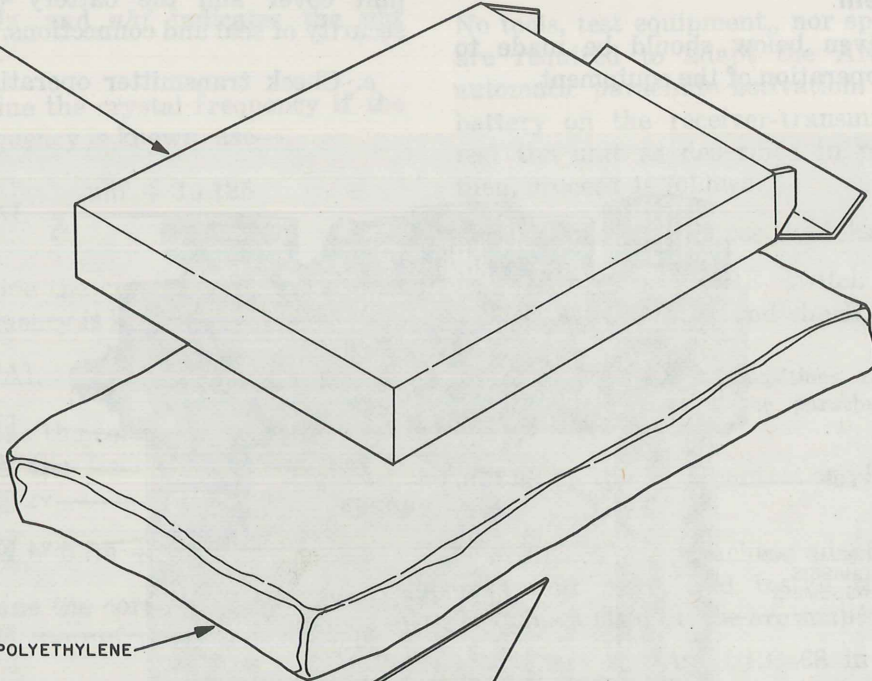
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Figure 2-1. Packaging of receiver-transmitter unit earphones and technical manual.

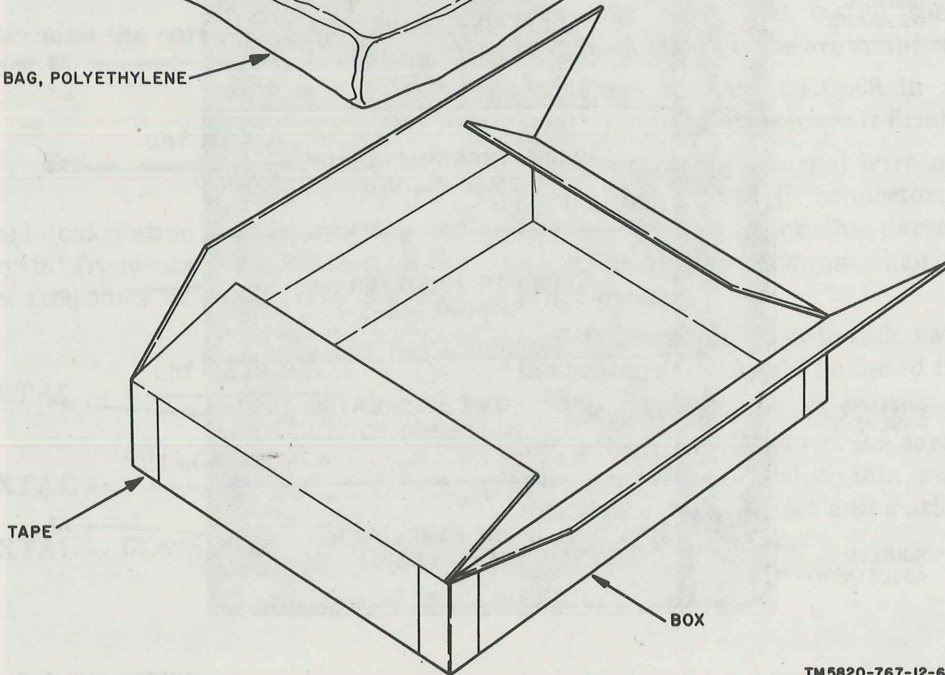
BATTERY BA-1112/U



BOX



BAG, POLYETHYLENE



TAPE

BOX

TM5820-767-12-6

Figure 2-2. Packaging of battery.

and four fm preset channels. Refer to paragraph 2-6 for method of determining required crystal frequency for a desired channel.

Crystal frequency (MHz)	Uhf channel (MHz)	Fm channel (MHz)
49.025	235.0	38.9
50.225	241.0	40.1
50.625	243.0	40.5

## 2-5. Initial Checking and Adjustment of Equipment

The checks given below should be made to assure proper operation of the equipment.

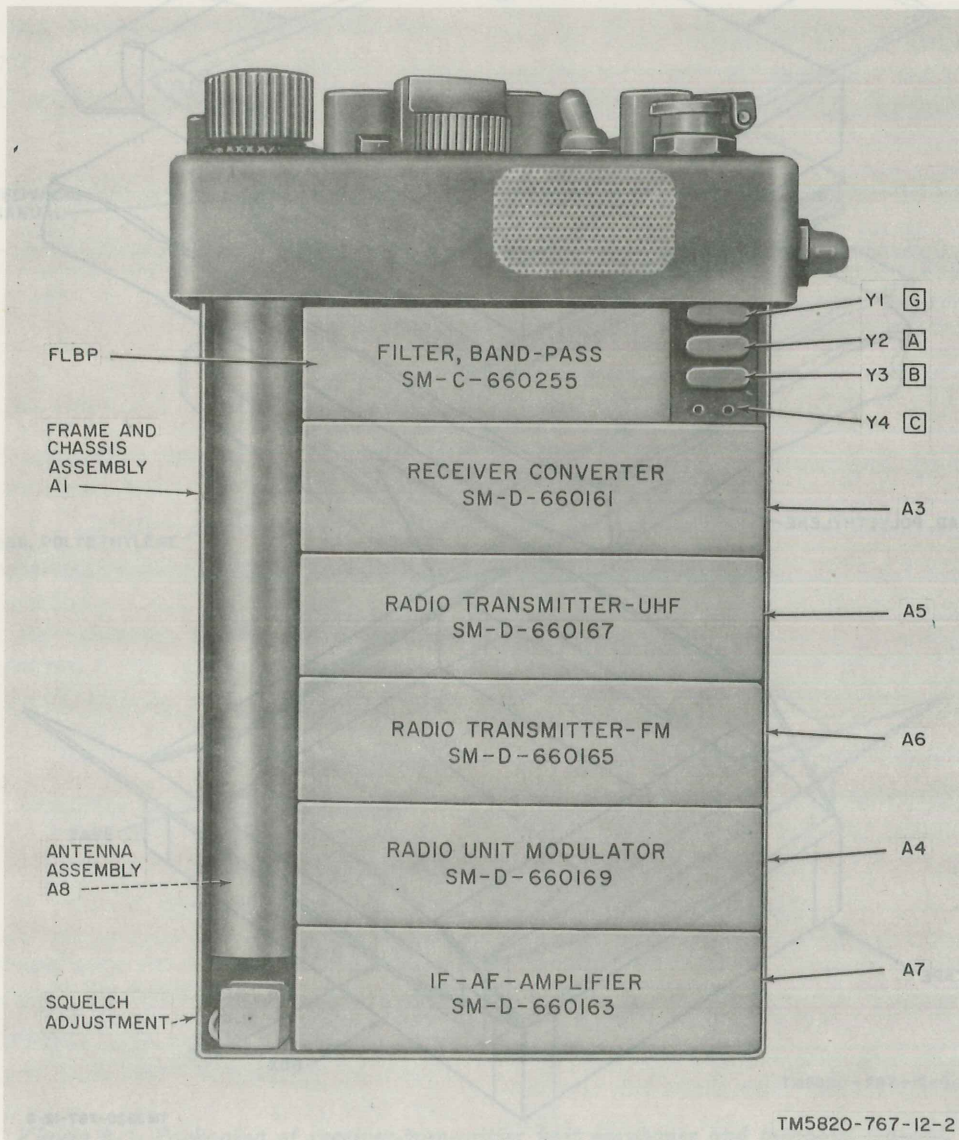
a. Remove the battery and perform the battery life test (para 4-10). Reinstall a satisfactory battery.

b. Determine the required channels of operation and be sure that the channels are noted on the front panel.

c. Check all controls and antenna for freedom of operation and proper detent action.

d. Visually check the receiver-transmitter unit cover and the battery connections for security of seal and connections.

e. Check transmitter operation of the AN/



TM5820-767-12-2

Figure 2-3. Receiver-transmitter unit, cover removed.

URC-68 as described in paragraphs 4-11 and 4-12.

## 2-6. Calculating Crystal Frequencies

When it is desired to operate the AN/URC-68 on a particular uhf channel, or its corresponding fm channel, the frequency of the crystal required can be determined by using the procedures given below. *XTAL* indicates the crystal frequency in MHz, *fm* indicates the fm channel in MHz, and *uhf* indicates the uhf channel in MHz.

a. To determine the crystal frequency if the uhf channel frequency is known, use—

$$XTAL = \frac{uhf + 10.125}{5}$$

b. To determine the crystal frequency if the fm channel frequency is known, use—

$$XTAL = fm + 10.125$$

c. To determine the corresponding uhf channel frequency if the fm channel frequency is known, use—

$$Uhf = 5 fm + 40.5$$

d. To determine the corresponding fm channel frequency if the uhf channel frequency is known, use—

$$Fm = \frac{uhf - 40.5}{5}$$

e. A sample calculation for determining the required crystal frequency for operation on the uhf channel frequency of 248.0 MHz is shown below:

$$XTAL = \frac{uhf + 10.125}{5}$$

$$XTAL = \frac{248.0 + 10.125}{5}$$

$$XTAL = 51.625 \text{ MHz}$$

Thus, the corresponding fm channel is—

$$Fm = \frac{uhf - 40.5}{5}$$

$$Fm = \frac{248 - 40.5}{5}$$

$$Fm = 41.5 \text{ MHz}$$

## 2-7. Preparation for Automatic Parachute Activation (fig. 1-2)

No tools, test equipment, nor special materials are required to adapt the AN/URC-68 for automatic parachute activation. Install a good battery on the receiver-transmitter unit and test the unit as described in paragraph 3-4; then, proceed as follows:

a. Completely collapse the telescopic antenna.

b. Turn the MODE switch to BCN, the CHAN switch to G, and the BAND switch to SW.

*Note.* These switch positions are determined by the configuration of the parachute adapter (fig. 1-2).

c. Turn the VOL control one-half turn clockwise.

d. Attach the parachute adapter to the radio set front panel and install the push-to-talk switch actuator (these are snap-on items).

e. Place the AN/URC-68 in the parachute holder provided and secure it firmly.

f. Connect the external wire antenna to the front panel EXT ANT connector. This antenna is attached to one of the parachute shrouds which erects the antenna when the parachute is deployed.

g. Remove the push-to-talk switch actuator; the beacon tone should be heard in the speaker.

h. Replace the push-to-talk switch actuator and attach the lanyard. Be sure the lanyard will remove the push-to-talk switch actuator to activate the radio set automatically when the parachute is deployed.

The test equipment and special materials are required to check the ANVRC-88 for automatic parachute activation. The test equipment and special materials are described in paragraph 3-4; the test procedure is as follows:

Channel Frequency (MHz)	Crystal Frequency (MHz)	XTAL - 101125
500.00	445.00	55.00
525.00	470.00	55.00

### 2-7. Preparation for Automatic Parachute Activation

No test equipment, nor special materials are required to check the ANVRC-88 for automatic parachute activation. The test equipment and special materials are described in paragraph 3-4; the test procedure is as follows:

1. Turn the power switch to the "ON" position. The test equipment and special materials are described in paragraph 3-4; the test procedure is as follows:

2. Turn the power switch to the "OFF" position. The test equipment and special materials are described in paragraph 3-4; the test procedure is as follows:

3. Turn the power switch to the "ON" position. The test equipment and special materials are described in paragraph 3-4; the test procedure is as follows:

4. Turn the power switch to the "OFF" position. The test equipment and special materials are described in paragraph 3-4; the test procedure is as follows:

5. Turn the power switch to the "ON" position. The test equipment and special materials are described in paragraph 3-4; the test procedure is as follows:

6. Turn the power switch to the "OFF" position. The test equipment and special materials are described in paragraph 3-4; the test procedure is as follows:

7. Turn the power switch to the "ON" position. The test equipment and special materials are described in paragraph 3-4; the test procedure is as follows:

The test equipment and special materials are required to check the ANVRC-88 for automatic parachute activation. The test equipment and special materials are described in paragraph 3-4; the test procedure is as follows:

8. Turn the power switch to the "ON" position. The test equipment and special materials are described in paragraph 3-4; the test procedure is as follows:

9. Turn the power switch to the "OFF" position. The test equipment and special materials are described in paragraph 3-4; the test procedure is as follows:

10. Turn the power switch to the "ON" position. The test equipment and special materials are described in paragraph 3-4; the test procedure is as follows:

11. Turn the power switch to the "OFF" position. The test equipment and special materials are described in paragraph 3-4; the test procedure is as follows:

12. Turn the power switch to the "ON" position. The test equipment and special materials are described in paragraph 3-4; the test procedure is as follows:

13. Turn the power switch to the "OFF" position. The test equipment and special materials are described in paragraph 3-4; the test procedure is as follows:

14. Turn the power switch to the "ON" position. The test equipment and special materials are described in paragraph 3-4; the test procedure is as follows:

15. Turn the power switch to the "OFF" position. The test equipment and special materials are described in paragraph 3-4; the test procedure is as follows:

16. Turn the power switch to the "ON" position. The test equipment and special materials are described in paragraph 3-4; the test procedure is as follows:

17. Turn the power switch to the "OFF" position. The test equipment and special materials are described in paragraph 3-4; the test procedure is as follows:

18. Turn the power switch to the "ON" position. The test equipment and special materials are described in paragraph 3-4; the test procedure is as follows:

Figure 2-1-1. Test equipment and special materials.

## CHAPTER 3 OPERATION

### 3-1. Description (fig. 3-1)

The AN/URC-68 can be operated while held in one hand. All operating controls, except the push-to-talk switch, are on the front panel. The MODE, BAND and CHAN switches have built-in permanent interlocks to prevent improper operating settings.

### 3-2. Controls and Jacks (fig. 3-1)

The operator's controls and jacks are listed and their functions described in the chart below.

Controls and jacks	Function
MODE switch (three-position)	<i>Operating mode</i>
BCN -----	An audio tone, swept from 1 kHz to 300 Hz (beacon tone), is transmitted 1 to 1½ times per second when push-to-talk switch is released.
PTT -----	Radio set operates in normal voice communications mode. Push-to-talk switch must be depressed to transmit.
MCW -----	A 1-kHz audio tone is transmitted when push-to-talk switch is depressed. When push-to-talk switch is released, radio set is in fm or uhf receive mode.
BAND switch (three-position)	
FM -----	Operates in conjunction with CHAN switch to select one of four crystal-controlled frequencies in fm band. MODE switch may be in any position.
UHF -----	Operates in conjunction with CHAN switch to select one of four crystal-controlled frequencies in uhf band. MODE switch may be in any position.

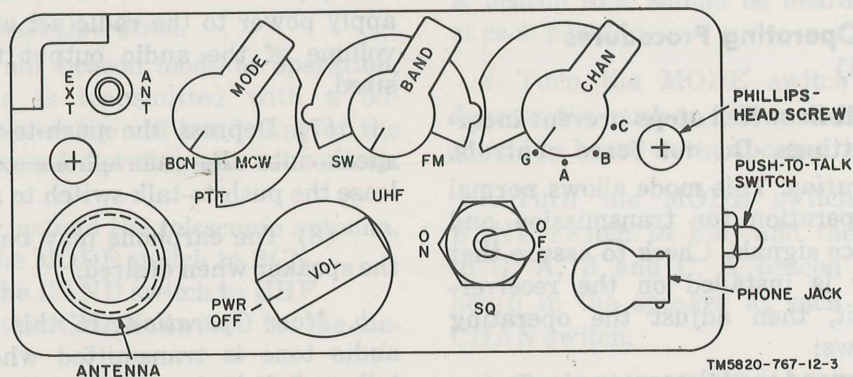


Figure 3-1. Radio Set AN/URC-68, operator's controls.

Controls and jacks	Function	
	<i>Sw pos</i>	<i>Operating mode</i>
	SW -----	Equipment alternately switches between fm and uhf bands. CHAN switch must be in G position, MODE switch must be in BCN position and push-to-talk switch must be released. Depressing push-to-talk switch turns equipment off.
CHAN switch (four-position) -----	G -----	Selects 40.5-MHz (fm) and 243.0-MHz (uhf guard channels).
	A, B, C -----	Selects three other frequencies as determined by installed crystals and BAND switch setting.
SQ switch -----	ON-squelch circuit is active.	Receiver is quiet, unless signal is being received.
	OFF-squelch circuit is inactive.	Normal receiver noise is heard when no signal is being received.
VOL control -----	Turns on power and determines receiver audio output level. Power is turned off in extreme ccw position.	
Phone jack -----	Permits use of earphone. When earphone is plugged in, speaker is disconnected.	
EXT ANT jack -----	Permits use of an external wire antenna. When using external antenna, telescopic antenna must be completely collapsed into radio set.	
Push-to-talk switch -----	When depressed, while in PTT mode of operation, transmitter is on, and when released receiver is on. In BCN mode of operation, AN/URC-68 is completely disabled when push-to-talk switch is depressed, and activated when switch is released.	

### 3-3. Modes of Operation

(fig. 3-1)

The AN/URC-68 is capable of operating in any of three modes: voice, beacon, or modulated continuous wave (mcw). Voice and mcw communication is possible on any preset channel, with or without squelch operation. Beacon operation can be switched or normal operation. Switched operation limits the beacon signal to only the fm and uhf guard channels on a time-shared basis. Normal beacon operation is not limited in any way and transmission on any of the preset channels is possible.

### 3-4. Normal Operating Procedures

(fig. 3-1)

**Caution:** Built-in switch stops prevent incorrect control settings. Do not force controls.

*a. Voice Operation.* This mode allows normal AN/URC-68 operation for transmission and reception of voice signals. Check to assure that a good battery is installed on the receiver-transmitter unit, then adjust the operating controls as follows:

- (1) Fully extend the telescopic antenna.
- (2) Set the MODE switch to PTT.

(3) Set the BAND switch to either FM or UHF, as desired (the BAND switch cannot be in the SW position for voice operation).

(4) Set the CHAN switch to the position that will provide the desired frequency, as listed on the front of the radio set.

(5) Set the SQ switch to either ON or OFF, as desired. When the SQ switch is set to ON, the receiver is quiet until a signal is being received. When it is set to OFF, normal receiver noise will be heard when no signal is being received.

(6) Turn the VOL control clockwise to apply power to the radio set and to adjust the volume of the audio output to the level desired.

(7) Depress the push-to-talk switch and speak into the microphone to transmit. Release the push-to-talk switch to receive.

(8) The earphone may be used instead of the speaker when desired.

*b. Mcw Operation.* In this mode, a 1-kHz audio tone is transmitted when the push-to-talk switch is depressed. Adjust the operating controls as follows:

- (1) Fully extend the telescopic antenna.
- (2) Set the MODE switch to MCW.
- (3) Position the BAND switch to either FM or UHF, as desired. (BAND switch cannot be in SW position.)
- (4) Set the CHAN switch to the desired position (the operating frequency for each channel is indicated on the front of the equipment).
- (5) Set the SQ switch to either ON or OFF, as desired.
- (6) Turn the VOL control clockwise to apply power to the equipment.
- (7) Depress the push-to-talk switch and note that a tone is heard in the speaker.

### 3-5. Beacon Operation

(fig. 3-1)

*a. Switched Operation.* In this mode of operation, the beacon tone is alternately transmitted on the fm guard frequency (40.5 MHz) and the uhf guard frequency (243.0 MHz). Set the operating controls as follows:

- (1) Fully extend the telescopic antenna.
- (2) Set the MODE switch to BCN.
- (3) Set the CHAN switch to G.
- (4) Set the BAND switch to SW. Built-in interlocks prevent setting the BAND switch to SW before the MODE and CHAN switches have been properly positioned.
- (5) Turn the VOL control clockwise to apply power.
- (6) Check to see that the push-to-talk switch is released.
- (7) Note that the beacon tone is heard in the speaker.

*b. Normal Beacon Operation.*

(1) In the uhf beacon mode of operation, the beacon tone is transmitted with a 50-percent duty cycle on the uhf band. Any of the channels may be used. Set the radio set controls as follows:

- (a) Fully extend the telescopic antenna.
- (b) Set the MODE switch to BCN.
- (c) Set the BAND switch to UHF.
- (d) Set the CHAN switch to the desired channel.
- (e) Turn the VOL control clockwise to apply power.

(f) Check to see that the push-to-talk switch is released.

(g) Note that the beacon tone is heard in the speaker at one-half the rate noted in *a* above.

(2) The fm beacon mode of operation is identical with that of uhf the uhf beacon mode of operation, described in (1) above, except that the BAND switch is set to FM.

### 3-6. Operational Checks

During operation or premission checks, be alert for malfunctions. Report any malfunction, failure, or discrepancy noted during the operational checks as required by TM 38-750. During the checks note the following conditions:

- a.* Loose knobs or binding controls.
- b.* Clarity of sidetone.
- c.* Squelch operation.
- d.* Clarity of reception.

### 3-7. Operational Procedures

Connect a good battery to the receiver-transmitter unit, fully extend the telescopic antenna, set the controls, and perform the operational checks (para 3-6) as follows:

- a.* Turn the VOL control fully clockwise to apply power and set the SQ switch to OFF.
- b.* Turn the MODE switch to BCN, the CHAN switch to G, and the BAND switch to UHF. A beacon tone should be heard in the speaker.
- c.* Turn the CHAN switch to each position. A beacon tone should be heard in the speaker at each position.
- d.* Turn the MODE switch to MCW and depress the push-to-talk switch. A 1-kHz tone should be heard in the speaker.
- e.* Turn the MODE switch to BCN, the BAND switch to FM, and the CHAN switch to G, A, B and C. A beacon tone should be heard in the speaker at each position of the CHAN switch.
- f.* Turn the MODE switch to BCN, the CHAN switch to G, and the BAND switch to



SW. A beacon tone should be heard in the speaker at a repetition rate approximately twice that of the preceding tests.

g. Turn the BAND switch to UHF, the MODE switch to PTT, and the CHAN switch to each position. Receiver noise should be heard in the speaker at each position of the CHAN switch.

h. Turn the BAND switch to FM and the CHAN switch to each position. Receiver noise should be heard at each position of the CHAN switch.

i. Set the SQ switch to ON and repeat steps g and h above. The radio set should be quiet at each position of the CHAN switch.

### 3-8. Stopping Procedure

To stop the AN/URC-68, turn the VOL control counterclockwise to PWR OFF.

### 3-9. Recognition and Identification of Jamming

It is likely that, under tactical conditions, the AN/URC-68 will be jammed by the enemy. This jamming may be planned or accidental and will usually be caused by a strong signal transmitted on the same frequency as that being used. The signal being transmitted may, or may not, be a steady carrier or a modulated carrier. When it becomes difficult or impossible to receive the desired signal by varying the volume and/or frequency controls, use of an alternate band or frequency may be effective.

## CHAPTER 4

### ORGANIZATIONAL MAINTENANCE

---

#### Section I. GENERAL

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

This chapter contains instructions for organizational maintenance of the radio set. The instructions include the following duties to be performed by the organizational electronic equipment repairman. The tools and materials required are listed in paragraph 4-2.

- a. Before a mission, or daily, perform an operational (communication) test and preventive maintenance checks (para 4-4).
- b. Cleaning (para 4-5).

- c. Perform a monthly checkout with Test Set, Radio TS-2688/URC-68 (para 4-7).

- d. Troubleshooting (para 4-8).

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

- a. Tool Kit, Electronic Equipment TK-101/G.
- b. Cleaning Compound (Federal stock No. 7930-395-9542).
- c. Brush MIL-G-7241.
- d. Fine sandpaper No. 000.
- e. Clean, lint free cloth.

#### Section II. PREVENTIVE MAINTENANCE

#### 4-3. Organizational Preventive Maintenance

Preventive maintenance is the systematic care, servicing, and inspection of equipment to prevent the occurrence of trouble, reduce out-of-service time, and maintain equipment serviceability. The radio set requires no lubrication.

a. *Systematic Care.* The procedures described in paragraphs 4-4 through 4-7 cover routine systematic care and cleaning essential to the proper upkeep and operation of the equipment.

b. *Preventive Maintenance Checks and Services.* The preventive maintenance checks and

services charts (paras 4-4 and 4-7) outline the functions to be performed at specific intervals. These checks and services are designed to maintain the radio set in a serviceable condition. The charts list what to check, how to check, and the normal conditions. The *References* column lists the paragraphs or applicable technical manuals that contain supplementary information. If the defect cannot be remedied at the organizational category a higher category of maintenance or repair is required. Records and reports of these checks must be made in accordance with instructions given in TM 38-750.

#### 4-4. Preflight/Daily Preventive Maintenance Checks and Services Chart

Sequence No.	Item to be inspected	Procedure	References
1	Exterior surfaces -----	a. Inspect unit for corrosion -----	a. Para 4-5.
2	Telescopic antenna -----	b. Clean exterior surfaces ----- Clean telescopic antenna and tighten if necessary.	b. Para 4-5. None.

Sequence No.	Item to be inspected	Procedure	References
3	Controls -----	Check to see that all controls operate with proper detent action.	Para 3-6.
4	Phone jack -----	Check phone jack for operation and good contact.	None.
5	Receiver-transmitter unit cover and battery.	Check cover for cracks or damage; replace damage item.	None.
6	Operation -----	Perform operational test to determine overall equipment performance, with and without earphone.	Para 3-7.

#### 4-5. Cleaning

All exterior surfaces of the equipment should be free of dirt, grease, and fungus. Perform the following maintenance, as specified in the preventive maintenance checks and services charts.

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

**Warning:** Prolonged breathing of cleaning compound is dangerous; provide adequate ventilation; cleaning compound is flammable; do not use near open flame. Avoid contact with the skin; wash off any that spills on the hands.

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

c. Clean the front panel and controls; use a clean, soft cloth. If dirt is difficult to remove, dampen the cloth with water; if necessary, use mild soap.

d. Remove corrosion from surfaces by light-

ly sanding them with fine sandpaper. Brush two thin coats of paint on the bare metal surface to protect it from further corrosion. Refer to the applicable cleaning and refinishing practices specified in TB SIG 364.

#### 4-6. Monthly Preventive Maintenance

Perform the maintenance functions indicated in the monthly preventive maintenance checks and services chart (para 4-7) 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. Adjustment 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 monthly preventive maintenance checks and services performed on it. Equipment in limited storage requires service before operation; however, it does not require monthly preventive maintenance.

#### 4-7. Monthly Preventive Maintenance Checks and Services Chart

Sequence No.	Item to be inspected	Procedure	References
1	Cleanliness -----	a. Clean exterior surfaces ----- b. Clean battery connections -----	Para 4-5.
2	Preservation -----	Inspect exterior for signs of fungus and corrosion; clean and preserve as required.	Para 4-5.
3	Controls -----	Test controls, jacks, and telescopic antenna for signs of damage, wear, and proper operation; record any defects.	Para 3-6.
4	Exterior -----	Inspect exterior covers for cracks or other visible damage; record any defects noted.	None.
5	Earphone -----	Clean earphone. Inspect for visible signs of damage to earphone, connectors, and wire. Record any defects noted and replace if necessary.	None.

Sequence No.	Item to be inspected	Procedure	References
6	Parachute adapter kit -----	a. Inspect for damage, cleanliness, and missing parts.	None.
7	Battery life test -----	b. Test operation of antenna connector, and all snap-on items; replace if necessary. With Test Set, Radio TS-2688/URC-68, determine remaining useful battery life; replace battery if necessary.	Para 4-10.
8	RF power output test -----	With Test Set, Radio TS-2688/URC-68, check RF power output of fm and uhf transmitters; replace AN/URC-68 if unsatisfactory.	Paras 4-11 and 4-12.
9	Publications -----	Inventory all publications pertinent to equipment to assure they are on hand, complete, serviceable, and current.	DA Pam 310-4.
10	Modifications -----	Check DA Pam 310-7 to determine whether new applicable MWO's have been published. All URGENT MWO's must be applied immediately. All NORMAL MWO's must be scheduled.	TM 38-750 and DA Pam 310-7.
11	Spare parts -----	Check all spare parts on hand for general condition and method of storage. No overstock should be evident, and all shortages must be on valid requisitions.	

### Section III. TROUBLESHOOTING

#### 4-8. General Troubleshooting Procedures

Troubleshooting at the organizational maintenance category is limited to operational checks with Test Set, Radio TS-2688/URC-68 (test set) to isolate troubles to an item replaceable at the organizational maintenance category. Troubles not correctible within the authorized area of organizational maintenance responsibility must be referred to a higher category of maintenance.

#### 4-9. Removal and Replacement of Battery (fig. 1-1)

##### a. Removal.

(1) Unscrew the large, slotted, captive screw near the bottom of the battery.

(2) Pull the battery down and out to separate it from the receiver-transmitter unit.

##### b. Replacement.

(1) Align contacts on the battery with those on the receiver-transmitter unit.

(2) Press the battery up and in; then tighten the large, slotted, captive screw near the bottom of the battery.

#### 4-10. Battery Life Test (fig. 4-1)

Battery voltage, under load, of less than 10.5 volts indicates a failing battery. Perform the battery life test with the test set as follows:

a. Remove the battery from the receiver-transmitter unit (para 4-9).

b. Shift the test set toggle switch, located adjacent to the meter, to BATTERY.

c. Connect the battery to the test set battery test prod. The configuration of the battery test prod prevents a reversed connection.

d. Depress the press-to-test switch on the battery test prod.

e. Read the indication on the test set meter and determine the remaining average battery life from the chart in the test set cover.

f. Install a new battery if it is so indicated.

g. Before installing a new battery, test it as described above.

#### 4-11. Fm Transmitter RF Power Output Test (fig. 4-1)

Test the fm transmitter RF power output as follows:

a. Install a good battery on the receiver-transmitter unit, as described in paragraph 4-9.

b. Completely collapse the telescopic antenna.

c. Set the test set toggle switch to RADIO.

d. Connect the test set FM prod to the EXT ANT jack on the radio set front panel.

e. Set the radio set controls as follows:

(1) BAND switch to FM.

(2) MODE switch to PTT.

(3) CHAN switch to G.

(4) VOL control one-quarter turn clockwise.

f. Press the radio set push-to-talk switch.

g. The test set meter should indicate greater than half-scale (in the green area). Less than half-scale on the test set meter indicates that the fm transmitter under test is defective and should be replaced.

h. Perform the above test with the CHAN switch set to each of its positions.

#### 4-12. Uhf Transmitter RF Power Output Test (fig. 4-1)

Test the uhf transmitter rf power output as described in paragraph 4-11, with the following exceptions:

a. Connect the test set UHF prod to the EXT ANT jack on the radio set front panel.

b. Set the radio set BAND switch to UHF.

c. Check the test set meter for at least a midscale indication. Less than half-scale on the test set meter indicates that the uhf transmitter under test is defective and should be replaced.

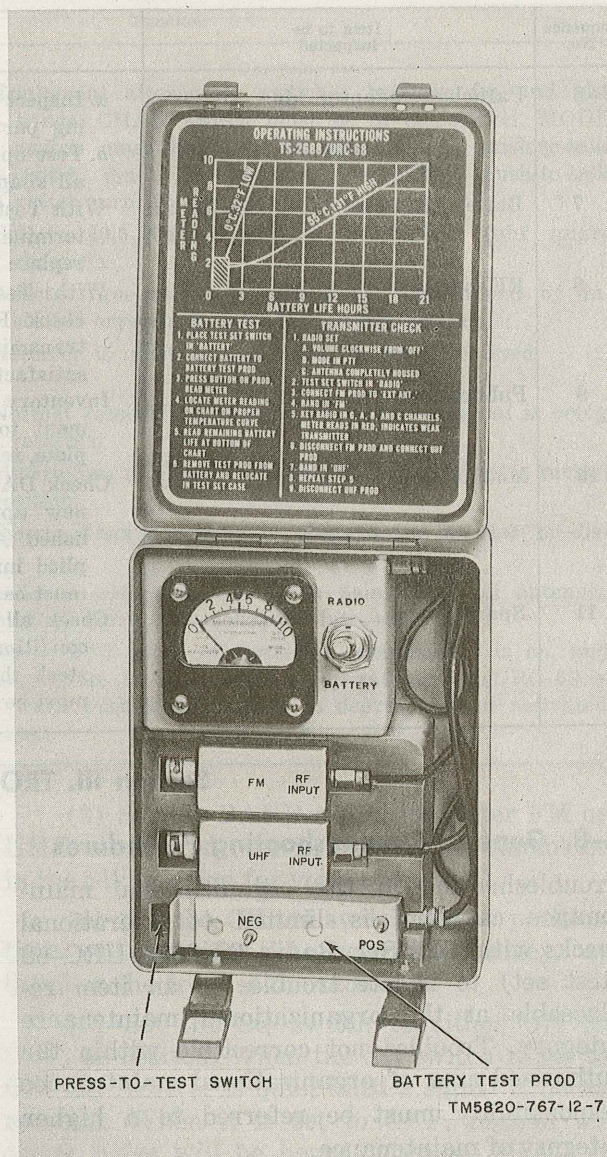


Figure 4-1. Radio Test Set TS-2688/URC-68.

## CHAPTER 5

### SHIPMENT, LIMITED STORAGE, AND DEMOLITION

#### Section I. SHIPMENT AND LIMITED STORAGE

##### 5-1. General

This section provides instructions for repackaging Radio Set AN/URC-68 in preparation for shipment and limited storage. Before packaging, the completeness of the radio set should be determined by a visual inspection and any missing or obviously damaged components listed. If the radio set is complete, perform an operating test as described in paragraph 3-7 and record the results. The radio set, less the battery, is packaged and stored as a complete assembled unit and no disassembly instructions are required.

##### 5-2. Repackaging

Repackaging of equipment for shipment or limited storage normally will be performed at a packaging facility, or by a repackaging team. If emergency packaging is required, select the materials from those listed in SB 38-100.

Package the equipment in accordance with the original packaging, so far as possible, with the materials available. Required materials are listed below:

##### *a. Radio Set AN/URC-68 (Less Battery) (fig. 2-1).*

Material	Quantity or size
Box PPP-B-636 -----	11½" by 9" by 2½".
Bag, polyethylene L-P-378 --	15" by 10".
Bag, polyethylene L-P-378 --	8" by 6".
Bubble cushioning type C, MIL-C-81013.	As required.
Tape, 2-inch PPP-T-76-1 ----	As required.

##### *b. Battery BA-1112/U (fig. 2-2).*

Material	Quantity or size
Box PPP-B-636 -----	5" by 4" by 1¼".
Bag, polyethylene L-P-378 --	9" by 5".
Box PPP-B-566 -----	4½" by 3¾" by ¾".
Tape, 2-inch PPP-T-76-1 ----	As required.

#### Section II. DEMOLITION TO PREVENT ENEMY USE

##### 5-3. Authority for Demolition

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

##### 5-4. Methods of Destruction

When destruction is ordered, or loss to the

enemy is eminent, the AN/URC-68 should be destroyed. Be careful to insure damage to all parts to avoid possible reuse after repair by cannibalization. Insure that all spare batteries, crystals, and modules are destroyed.

##### 5-5. Reporting

Report destruction of Radio Set AN/URC-68 and spare parts through command channels.



## APPENDIX A REFERENCES

---

The following publications contain information applicable to the operation and maintenance of Radio Set AN/URC-68.

- |                    |   |
|--------------------|---|
| DA Pam 310-4       | Index of Technical Manuals, Technical Bulletins, Supply Manuals (types 4, 6, 7, 8, and 9), Supply Bulletins, and Lubrication Orders |
| DA Pam 310-7       | U. S. Army Equipment Index of Modification Work Orders  |
| SB 38-100          | Preservation, Packaging and Packing Materials, Supplies, and Equipment Used by the Army   |
| TB SIG 364         | Field Instructions for Painting and Preserving Electronics Command Equipment  |
| TM 11-6625-1712-12 | Operator and Organizational Maintenance Manual, Test Set, Radio TS-2688/URC-68  |
| TM 38-750          | Army Equipment Record Procedures  |



and four in each channel. Refer to paragraph 2-4 for methods required to determine frequency for a desired channel.

a. Remove the battery and perform the battery life test (para 4-19). Reinstall a satisfactory battery.

Channel No.	Frequency (MHz)	Power (W)
1	0.782	10
2	0.782	10
3	0.782	10
4	0.782	10

Determine the required channels of operation and be sure that the channels are noted on the front panel.

**APPENDIX A  
REFERENCES**

- DA Pam 810-4, Maintenance and Repair Manual, Technical Manual, Technical Manual, and Lubrication Orders (NA and for maintenance activities of 810, 811, and 812).
- DA Pam 810-7, U.S. Army Equipment Index of Modification Work Orders.
- SB 88-100, Preservation Packets and Repair Manuals, Supplies and Equipment.
- TB SIG 364, Field Maintenance Manual for the Signal Battalion Command.
- TM 11-6825-10-10, Signal Battalion Maintenance Manual, Signal Battalion Command.
- TM 88-760, Signal Battalion Maintenance Manual, Signal Battalion Command.

Figure 1-3. Receiver-transmitter unit, cover removed.

## APPENDIX B

### BASIC ISSUE ITEMS

#### Section I. INTRODUCTION

##### B-1. Scope

This appendix lists items comprising an operable equipment and those required for installation, operation, or operator's maintenance for Radio Set AN/URC-68.

##### B-2. Explanation of Columns

The following is a list of explanations of columns in section II.

###### *a. Source, Maintenance, and Recoverability Codes (SMR) Column.*

(1) *Source Code (S)*. The selection status and source for the listed item is the first code indicated in this column. The source code used and its explanation is—

Code	Explanation
------	-------------

P	Applies to repair parts that are stocked in or supplied from GSA/DSA, or Army supply system, and authorized for use at indicated maintenance categories.
---	--

(2) *Maintenance code (M)*. The lowest category of maintenance authorized to install the item is indicated by the second code in this column. The maintenance category code and its explanation is:—

Code	Explanation
------	-------------

O	Organizational maintenance
---	----------------------------

(3) *Recoverability code (R)*. Now used.

*Note.* When no code is indicated in the recoverability column, the part will be considered expendable.

*b. Federal Stock Number Column.* This column indicates the Federal stock number for the item.

*c. Description Column.* This column includes the Federal item name and any additional description of the item which may be required. A part number or other reference number is followed by the applicable five-digit Federal supply code for manufacturers. *Usable on code* column is not used.

*d. Unit of Measure Column.* The unit used as a basis of measure (e.g., ea, pr, ft, yd, etc.) is given in this column.

*e. Quantity Incorporated in Unit Column.* The total quantity of the item used in the equipment is given in this column. Items authorized for use as required, but not for initial stockage, are identified with an asterisk.

*f. Quantity Furnished With Equipment Column.* This column lists the quantity of the item supplied for initial operation of the equipment and/or the quantities authorized to be kept on hand by the operator for maintenance of the equipment.

*g. Illustrations Column.*

(1) *Figure number (a)*. The number of the illustration on which the item is shown is indicated in this column.

(2) *Item No. or reference designation (b)*  
Not used.

##### B-3. Federal Supply Codes

This paragraph lists the Federal supply code with the associated manufacturer's name.

Code	Manufacturer's name
37695	-----Magnovox Co.

SECTION II. BASIC ISSUE ITEMS

(1) SMR CODE	(2) FEDERAL STOCK NUMBER	(3) DESCRIPTION  Reference Number & Mfr Code  USABLE ON CODE	(4) UNIT OF MEAS	(5) QTY INC IN UNIT	(6) QTY FURN WITH EQUIP	(7) ILLUSTRATIONS	
						(a) FIG. NO.	(b) ITEM NO. OR REFERENCE DESIGNATION
	5820-832-9158	RADIO; SET AN/URC-68: (This item is nonexpendable)  TECHNICAL MANUAL TM 11-5820-767-12  Requisition through pinpoint account number if assigned; otherwise through nearest Adjutant General facility.  A quantity of one technical manual is packed with each equipment. Where a valid need exists, additional copies may be requisitioned and kept on hand.	ea			1-1	
P-O	6135-935-5241	BATTERY BA-1112/U: 538113-801; 37695	ea	1	1	1-1	
P-O	5965-055-0648	EARPHONE ASSEMBLY H-281/URC-68: 717084-801; 37695  ACCESSORIES, TOOLS, OR TEST EQUIPMENT	ea	1	1	1-1	
P-O	5020-791-1510	PARACHUTE ADAPTER KIT MK-8197/URC-68: 717083-801; 37695 (NOTE: Organizations will requisition the AN/URC-68 less the Parachute Adapter Kit, with the exception of aircraft units equipped with ejection seat survival kits.)  NO BASIC ISSUE ITEMS ARE MOUNTED IN OR ON THIS EQUIPMENT	ea	*		1-2	

## APPENDIX C

### MAINTENANCE ALLOCATION

#### Section I. INTRODUCTION

##### C-1. General

This appendix provides a summary of the maintenance operations covered in the equipment literature for Radio Set AN/URC-68. 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.

##### C-2. Explanation of Format for Maintenance Allocation Chart

a. *Group Number.* Not used.

b. *Component Assembly Nomenclature.* This column lists the item names of component units, assemblies, subassemblies, and modules on which maintenance is authorized.

c. *Maintenance Function.* This column indicates the maintenance category at which performance of the specific maintenance function is authorized. Authorization to perform a function at any category also includes authorization to perform that function at higher categories. The codes used represent the various maintenance categories as follows:

Code	Maintenance category
C -----	Operator/crew
O -----	Organizational maintenance
F -----	Direct support maintenance
H -----	General support maintenance
D -----	Depot maintenance

d. *Tools and Equipment.* The numbers appearing in this column refer to specific tools and equipment which are identified by these numbers in section III.

e. *Remarks.* Self-explanatory.

##### C-3. Explanation of Format for Tool and Test Equipment Requirements

The columns in the tool and test equipment requirements chart are as follows:

a. *Tools and Equipment.* 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 for the maintenance function.

b. *Maintenance Category.* The codes in this column indicate the maintenance category normally allocated the facility.

c. *Nomenclature.* This column lists tools, test, and maintenance equipment required to perform the maintenance functions.

d. *Federal Stock Number.* This column lists the Federal stock number.

e. *Tool Number.* Not used.

SECTION II. MAINTENANCE ALLOCATION CHART

GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTIONS											TOOLS AND EQUIPMENT	REMARKS	
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD			
	RADIO SET AW/URC-68	0	0	0	0	0	0	0	0	0	0	0	0	12,21	Repair is limited to replace battery and earphone assy. in AW/URC-68
	BATTERY BA-1112/U	0	0	0	0	0	0	0	0	0	0	0	0	1 thru 20	Evacuate defective modules and frame assembly to depot
	↓ EARPHONE ASSEMBLY H-281/URC-68	0	0	0	0	0	0	0	0	0	0	0	0	1 thru 20	Discard defective earphone. No special tools required.
	PARACHUTE ADAPTER MX-8197/URC-68	0	0	0	0	0	0	0	0	0	0	0	0	21	This item installed only in OV-1( ) Aircraft

SECTION III. TOOL AND TEST EQUIPMENT REQUIREMENTS

TOOLS AND EQUIPMENT	MAINTENANCE CATEGORY	NOMENCLATURE	FEDERAL STOCK NUMBER	TOOL NUMBER
1	F,H	AN/URC-68 (continued)	6625-783-5965	
2	F,H	AUDIO OSCILLATOR AN/URM-127	6625-647-3637	
3	F,H	DEVIATION METER ME-57/U	6625-668-9418	
4	F,H	DISTORTION ANALYZER TS-723/U	6625-911-6368	
5	F,H	FREQUENCY METER AN/USM-207	6625-987-6603	
6	F,H	OSCILLOSCOPE AN/USM-140B	6130-635-4900	
7	F,H	REGULATED POWER SUPPLY PP-1104/G	6625-553-1178	
8	F,H	RF SIGNAL GENERATOR AN/URM-48	6625-538-9415	
9	F,H	RF SIGNAL GENERATOR AN/USM-44A	6625-553-1178	
10	F,H	AC VTVM ME-30B/U	6625-643-1670	
11	F,H	RF VTVM AN/URM-145	6625-973-3986	
12	O,F,H	RF DETECTOR DT-307/G	6625-876-3106	
13	F,H	RADIO TEST SET, TS-2688/URC-68	6625-782-0389	
14	F,H	ANTENNA SIMULATOR (W1A) MX68951210		
15	F,H	ANTENNA SIMULATOR (W1B) MX68951208		
16	F,H	ANTENNA SIMULATOR (W1C) MX68951209		
17	F,H	ANTENNA SIMULATOR (W1D) MX68951207		
18	F,H	CABLE ASSEMBLY (W2) MX68951212		
19	F,H	CABLE ASSEMBLY (W3) MX68951217	5180-605-0079	
20	F,H	TOOL KIT TK-100/G	5180-610-8177	
21	0	TOOL KIT TK-105/G		
		TOOL KIT TK-101/G	5180-064-5178	

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Hertz (Hz) (beacon tone) at a rate of 1 to 1 1/4 times per second.

(3) Transmission of a 1-kHz audio tone when activated by the proximity of a downburst wave (mex, mcd).

(4) Beacon operation, transmitting the beacon tone, switched alternately between the guard frequencies in the 40.5-megahertz (MHz) fm band and the 243.0-MHz uhf band.

(5) Additional use with parachute (app. g. ter 28 allows the radio set to operate automatically after parachute activation during

aircraft ejection. The parachute ejection kit is necessary in fixed wing aircraft ejection-type seats.

The contents of Radio Set 243.0-MHz are listed in the blank issue items list (app. E).

### 1-2. Technical Characteristics

a. General.

Frequency:

40.5 to 42.0 MHz  
243.0 to 243.5 MHz