TM 11-5820-667-12

DEPARTMENT OF THE ARMY TECHNICAL MANUAL

Operator's and Organizational Maintenance Manual
Including Repair Parts List

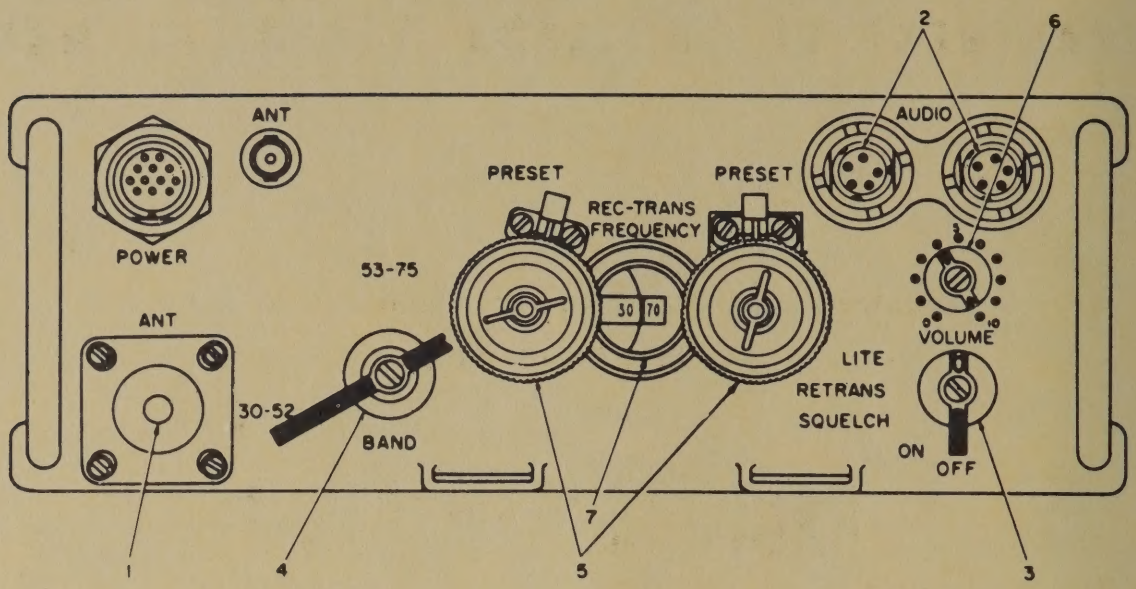
RADIO SET AN/PRC-77

(Including Receiver-Transmitter, Radio RT-841/PRC-77)

This copy is a reprint which includes current pages from Changes 1 through 7.

HEADQUARTERS, DEPARTMENT OF THE ARMY
JUNE 1967

CONDENSED OPERATING INSTRUCTIONS FOR RADIO SET AN/PRC-77



TO OPERATE SET

A. THE NUMBERS OF STEPS 1 THROUGH 6 BELOW RELATE TO THE NUMBERS ON THE DIAGRAM.

(1) INSTALL THE ANTENNA REQUIRED FOR THE TYPE OF OPERATION IN THE ANT MOUNT.

(2) ATTACH HANDSET H-189/GR TO EITHER AUDIO CONNECTOR.

(3) TURN THE FUNCTION SWITCH TO ON.

(4) TURN THE BAND SWITCH TO THE DESIRED OPERATING FREQUENCY BAND.

(5) TURN THE MC TUNING AND KC TUNING CONTROL KNOBS UNTIL THE DESIRED FREQUENCY APPEARS IN THE CHANNEL DIAL (7).

(6) TURN THE VOLUME CONTROL TO 4.

(7) PRESS THE HANDSET H-189/GR PUSH-TO-TALK SWITCH AND SPEAK INTO HANDSET. RELEASE THE PUSH-TO-TALK SWITCH TO LISTEN.

(8) ADJUST THE VOLUME CONTROL (6) FOR A DESIRABLE SOUND LEVEL.

(9) TO REDUCE THE RUSHING NOISE WHEN NO SIGNAL IS BEING RECEIVED, TURN SWITCH (3) TO SQUELCH.

TO TURN SET OFF

B. TURN THE FUNCTION SWITCH (3) TO OFF.

WARNING

The fumes of TRICHLOROETHANE are toxic. Provide thorough ventilation whenever it is used, avoid prolonged or repeated breathing of vapor. Do not use near an open flame or hot surface; trichloroethane is nonflammable but heat converts the fumes to a highly toxic phosgene gas the inhalation of which could result in serious injury or DEATH. Prolonged or repeated skin contact with trichloroethane can cause skin inflammation. When necessary, use gloves, sleeves and aprons which the solvent cannot penetrate.

WARNING

REMOVE THE BATTERY FROM BATTERY BOX CX-2562/PRC-25 (FIG. 2-2) WHEN RT-841/PRC-77 IS NOT BEING USED. ALSO AT QUARTERLY PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PARA 5-5), REMOVE RECEIVER-TRANSMITTER FROM ITS CASE AND BLOW OUT THE CHASSIS TO REMOVE ANY HYDROGEN GAS THAT MAY HAVE ACCUMULATED FROM THE MAGNESIUM BATTERY BA-4386/U. THE PRESSURE RELIEF VALVE MUST BE INSTALLED (PARA 1-7*a*(2)) TO HELP VENT THE HYDROGEN GAS PRODUCED BY THE BA-4386/U.

CAUTION

Do not change channels or the frequency band while the radio is keyed for transmission (handset push-to-talk switch depressed). Damage to the radio modules may result or the wrong channel frequency may be set up, thus preventing radio communication.

TECHNICAL MANUAL
No. 11-5820-667-12

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, DC, *7 June 1967*

OPERATOR AND ORGANIZATIONAL MAINTENANCE MANUAL

RADIO SET AN/PRC-77 (NSN 5820-00-930-3724)
(INCLUDING RECEIVER-TRANSMITTER, RADIO RT-841/PRC-77 (NSN 5820-00-930-3725))

		Paragraphs	Pages
CHAPTER 1.	INTRODUCTION		
SECTION I.	General	1-1—1-3.4	1-1
II.	Description and data	1-4—1-8	1-2—1-5
CHAPTER 2.	INSTALLATION	2-1—2-6	2-1—2-7
3.	OPERATING INSTRUCTIONS	3-1—3-11	3-1—3-8
4.	OPERATOR'S MAINTENANCE INSTRUCTIONS		
SECTION I.	Preventive maintenance	4-1—4-3	4-1—4-5
II.	Trouble shooting	4-4—4-6	4-5—4-6
CHAPTER 5.	ORGANIZATIONAL MAINTENANCE		
SECTION I.	General	5-1—5-2	5-1
II.	Preventive Maintenance	5-3	5-1 -5-3
III.	Troubleshooting	5-4—5-6	5-4—5-6
CHAPTER 6.	MATERIEL USED IN CONJUNCTION WITH RADIO SET AN/PRC-77	6-1—6-9	6-1—6-30
APPENDIX A.	REFERENCES		A1—A-2
B.	COMPONENTS OF END ITEM LIST		B-1—B-2
C.	MAINTENANCE ALLOCATION CHART		C-1—C-7
D.	Deleted.		
E.	ADDITIONAL AUTHORIZATION LIST		E-1—E-2
F.	EXPENDABLE SUPPLIES AND MATERIALS LIST		F-1—F-2
INDEX			I-1—I-2



Figure 1–1. Radio Set AN/PRC–77 in man-pack operation with 3-foot Antenna AT–892/PRC–25 installed.

CHAPTER 1

INTRODUCTION

Section I. GENERAL

1-1. Scope

a. This manual describes Radio Set AN/PRC-77 and covers its installation, operation, and operator's and organizational maintenance.

b. Maintenance allocation for the radio set is provided in appendix C. A listing of components is provided in paragraph 1-6 and appendix B. Additional equipment authorized to operate the radio is listed in appendix E.

c. Repair parts for organizational maintenance are provided in TM 11-5820-667-20P. Expendable supplies used for maintaining the radio are listed in appendix F.

1-2. Index 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 in TM 38-750.

b. Report of Packaging and Handling Deficiencies. Fill out and forward DD Form 6 (Packaging Improvement Report) as prescribed in AR 700-58/NAVSUPINST 4030.29/AFR 71-13/MCO P4030.29A, and DLAR 4145.8.

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

1-3.1. Reporting Equipment Improvement Recommendations (EIR)

EIR's shall be prepared using SF 368 (Quality Deficiency Report). Instruction for preparing SF 368 for EIR's are provided in TM 38-750 (The Army Maintenance Management System). EIR's should be mailed direct to Commander, US Army Communications and Electronics Materiel Readiness Command, ATTN: DRSEL-ME-MQ, Fort Monmouth, NJ 07703. A reply will be sent direct to you.

1-3.2. Reporting of Errors

The reporting of errors, omissions, and recommendations for improving this publication by the individual user is encouraged. Reports should be submitted on DA Form 2028 (Recommended Changes to Publications and Blank Forms) direct to Commander, US Army Communications and Electronics Materiel Readiness Command, ATTN: DRSEL-ME-MQ, Fort Monmouth, NJ 07703. A reply will be sent direct to you.

1-3.3. Administrative Storage

Administrative storage of the AN/PRC-77 will be handled as follows. The requirements apply whether the equipment is stored as part of a vehicle or stored alone.

a. Remove the battery (fig. 2-2).

b. Before and after storage, perform the following:

(1) Inventory the equipment (para 1-6).

(2) Clean the equipment (para 4-3).

(3) Perform operator's and organizational PMCS (tables 4-1 and 5-1). Correct all deficiencies. For uncorrected deficiencies, tag and date the deficiencies.

c. During storage, inventory the equipment and perform an operational test (para 3–4). These checks may be done approximately every 3 or 4 months.

d. Store the equipment in a dry and moisture-free area with safeguards against pilfering.

1–3.4. Destruction of Army Electronics Materiel

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

1–3.5. Hand Receipt Technical Manual

A Hand Receipt Technical Manual, TM 11–5820–667–12–HR, is available. It contains preprinted DA Form 2062 (Hand Receipt/Annex No.) listing the AN/PRC–77 parts as given in section II of appendix B. The Hand Receipt manual is published to aid property accountability and is available through: Commander, US Army Adjutant General Publications Center, ATTN: AGDL–OD, 1655 Woodson Road, St. Louis, MO 63114 in accordance with procedures for requisitioning publications through The Adjutant General publication channels. The Hand Receipt Technical Manual is entitled: Hand Receipt Manual Covering End Item/Components of End Item (COEI), Basic Issue Items (BII), and Additional Authorization List (AAL) Related to Radio Set AN/PRC–77.

Section II. DESCRIPTION AND DATA

1–4. Purpose and Use

(fig. 1–1)

a. Radio Set AN/PRC–77 is a man-pack, portable, frequency-modulated (fm) receiver-transmitter used to provide short-range, two-way, radio-telephone voice communication.

b. Receiver-Transmitter, Radio RT–841/PRC–77 is also used as part of Radio Sets, AN/VCR–64 and AN/GRC–160 (TM 11–5820–498–12).

c. Fm radio set with which the AN/PRC–77 can communicate are listed in paragraph 3–11 (fig. 3–3).

d. The AN/PRC–77 can also be used in conjunction with other equipment ((1) through (7) below).

(1) Antenna Equipment RC–292 (TM 11–5820–348–15) can be used in place of the whip antennas to extend the communication distance (para 6–3).

(2) The AN–PRC–77 can be connected to other fm radio sets for radio relay use by means of the cable in Retransmission Cable Kit MK–456/GRC (TM 11–5995–202–15; para 6–1). Such radios can be the AN/PRC–77, AN/PRC–25 (TM 11–5820–398–12); the vehicular versions of these radios: Radio Sets AN/VRC–53, AN/VRC–64, AN/GRC–125, and AN/GRC–160 (TM 11–5820–498–12); and the AN–VCR–12 series radios (TM 11–5820–401–12).

(3) Remote control of the AN/PRC–77 can be provided by Radio Set Control Group AN/GRA–39 (*) (para 6–7*a*) and Radio Set Control AN/GRA–6 (para 6–9*a*).

(4) Radio/wire integration (RWI) operation with the AN/PRC–77 and remote telephone facilities can be provided by Radio Set Control AN/GSA–7 with Oscillator O–574/GRA (para 6–8). The AN/GRA–39(*) (para 6–7*b*) and AN/GRA–6 (para 6–9*b*) can also be used with the AN/PRC–77 for RWI operation.

(5) The AN/PRC–77 can be used with Antenna, Homing Loop AT–784/PRC (para 6–4) for detection and location of homing beacons or other fm radios.

(6) The AN/PRC–77 can be used with Antenna AT–984A/G (para 6–5), a long-wire, multiple wavelength antenna to extend the transmission and reception ranges.

(7) The AN/PRC–77 can be used with secure voice equipment (para 6–19) and digital data equipment.

1–5. Technical Characteristics

Frequency range:	
Low band	30.00 to 52.95 mc±3.5 k.c.
High band	53.00 to 75.95 mc±3.5 kc.
Number of channels	920.
Channel spacing	50 kc.
Types of transmission and reception:	
Transmission	Voice (300–3,500 cps) and 150-cps squelch tone.

Reception	Voice (no squelch) or voice and 150-cps squelch tone.
Security or digital data equipment.	Wideband (10 to 20,000 cps) without 150-cps squelch tone.
Transmission and reception power requirements:	
Transmission	12.5 to 15 volts dc, 780 ma average.
Reception	12.5 to 15 volts dc, 0.06 amp average.
Type of modulation	Frequency.
Transmitter output power	1.5 to 4.0 watts.
Type of squelch	Tone operated by 150-cps signal.
Distance range	5 miles (8 kilometers) (varies with conditions).
Types of antennas:	
Short antenna	Antenna AT-892/PRC-25; 3 feet long, semirigid steel tape.
Long antenna	Antenna AT-271A/PRC; 10 feet long, multisection whip.
Power source	Battery, Dry BA-4386/U, or BA-398/U.
Battery life	60 hours (with a 9:1 receive-transmit ratio).

1-6. Items Comprising Operable Equipment (fig. 1-2)

A quantity of one each component is provided with the AN/PRC-77. Dimensions and weights of components is provided in paragraph 2-1*b*. A battery is required to operate the RT-841/PRC-77 (para 1-8).

Federal stock No.	*Item*
5820-930-3724	Radio Set AN/PRC-77 [a] consisting of:
5820-242-4967	Antenna AT-271A/PRC SMD182392; 80063
5820-889-3803	Antenna AT-892/PRC-25 SCDL135893; 80063
5820-086-7148	Battery Box CY-2562/PRC-25 SMD447322; 80063
5820-086-7138	Bag, Cotton Duck CW-503/PRC-25 SMC447163; 80063
5965-069-8886	Handset H-189/GR [b] SMC544226; 80063
5999-892-8094	Harness, Electrical Equipment ST-138/PRC-25 SMD447168; 80063
5820-930-3725	Receiver-Transmitter, Radio RT-841/PRC-77 SCDL447396; 80063
5820-086-7149	Support, Antenna AB-591A/PRC SCC85713; 80063

[a] TM 11-5820-667-12 contains operation, maintenance, and repair parts for Radio Set AN/PRC-77.
[b] Handset H-250/U (FSN 5965-043-3463) may be issued in lieu of H-189/GR.

1-7. General Description
(fig. 1-2)

Radio Set AN/PRC-77 consists of Receiver-Transmitter, Radio RT-841/PRC-77 and minor components. The RT-841/PRC-77 is described in *a* below; the minor components in *b* below.

a. Receiver-Transmitter, Radio RT-841/PRC-77. The RT-841/PRC-77 consists of the receiver-transmitter, the receiver-transmitter case, and Battery Box CY-2562/PRC-25.

(1) The receiver-transmitter is held in the receiver-transmitter case by four captive screws. The CY-2562/PRC-25 is attached to the receiver-transmitter case by two clamps. The complete RT-841/PRC-77, when assembled, is watertight. All controls are located on the front panel. A battery connector projects from the receiver-transmitter and mates with the connector of the battery.

(2) The CY-2562/PRC-25 is a lightweight metal case that protects and houses the battery. The battery sits on a foam pad that is attached to the bottom of the CY-2562/PRC-25.

(3) A pressure relief valve (fig. 2-2) is installed in CY-2562/PRC-25 to vent hydrogen gas (a by-product of the magnesium battery, BA-4386/U, discharge action) from the CY-2562/PRC-25 and thus prevent the gas from accumulating in the receiver-transmitter case and exploding. The valve is provided on new equipment and installed in used equipment per modification work order (MWO) 11-5800-211-30-1 (13 September 1972). The valve is required to prevent injury to personnel and prevent serious damage to the RT-841/PRC-77.

b. Minor Components (fig. 1-2).

(1) *Antenna AT-892/PRC-25.* The AT-892/GRC-25 is a one-section, 3-foot-long whip antenna. A spring at its base allows for positioning of the antenna to keep it in a vertical position, regardless of the position of the RT-841/PRC-77. This antenna is used for general short-range service and, because of its steel tape construction, can be folded into a small space.

(2) *Antenna AT-271A/PRC.* The AT-271A/PRC is composed of six sections; each section fits into the end of of a wider section. A stainless-steel, plastic-covered cable (or braided plastic cord), under spring tension, is threaded through the sections to keep them together in the operating condition. When the sections are folded, the cable keeps them together as a group, to prevent the loss of individual sections. Spring tension is provided by a spiral spring in the base section. This antenna is used when maximum range is required.

(3) *Support, Antenna AB-591A/PRC.* The AB-591A/PRC, which is of rigid tubular construction, is used as a main support of the AT-271A/PRC.

(4) *Harness, Electrical Equipment ST-138/PRC-25.* The ST-138/PRC-25 is made of cotton duck. It is used to secure the RT-841/PRC-77 so that it can be carried on the operator's back.

(5) *Bag, Cotton Duck CW-503/PRC-25.* The CW-503/PRC-25 is sectionalized into several pockets which are used to store the two antennas, the antenna support, and handset ((6) below (fig. 1-3).

(6) *Handset* (fig. 1-4). Either of the following handsets may be issued with the AN/PRC-77.

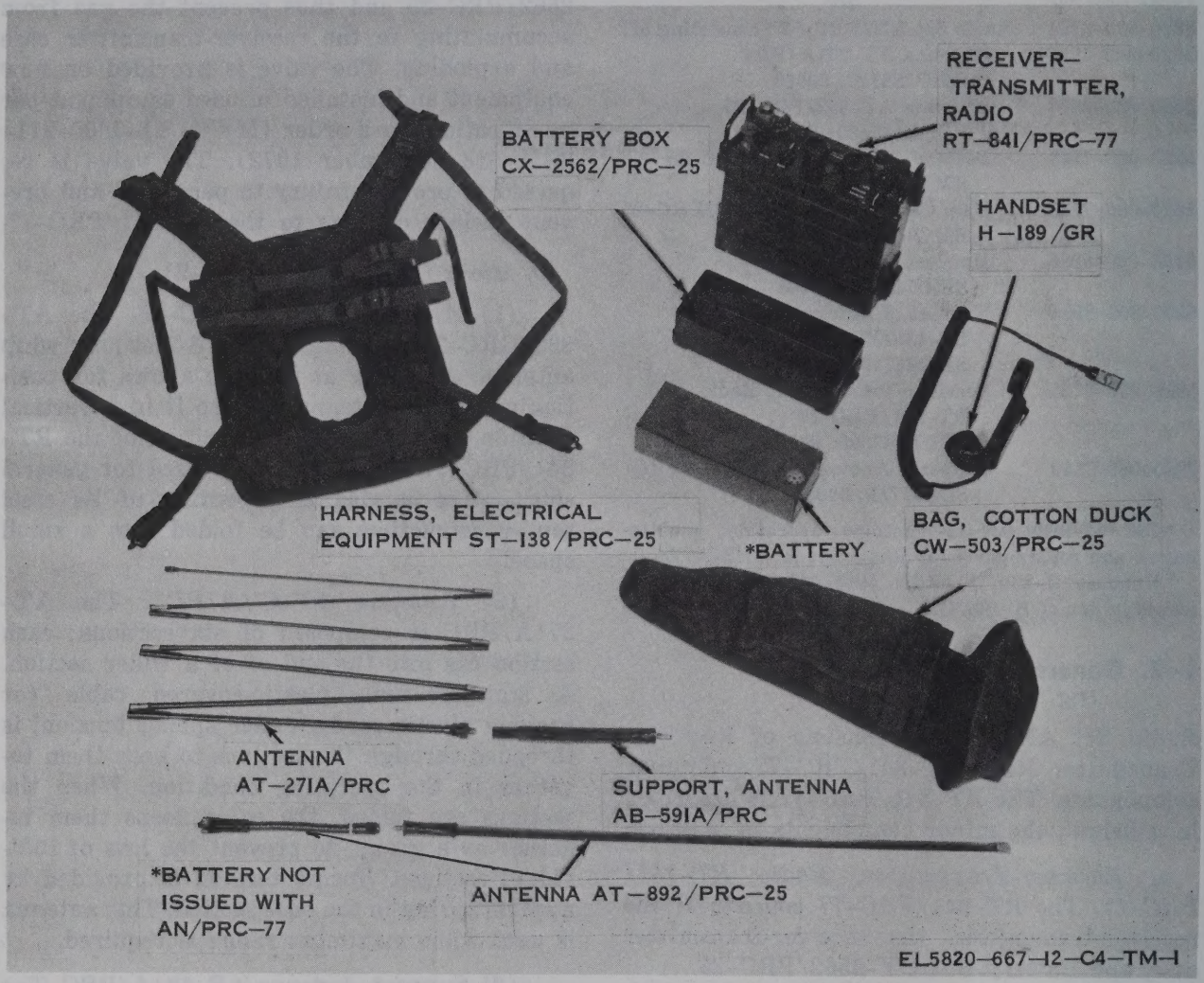


Figure 1-2. Radio Set AN/PRC-77, components.

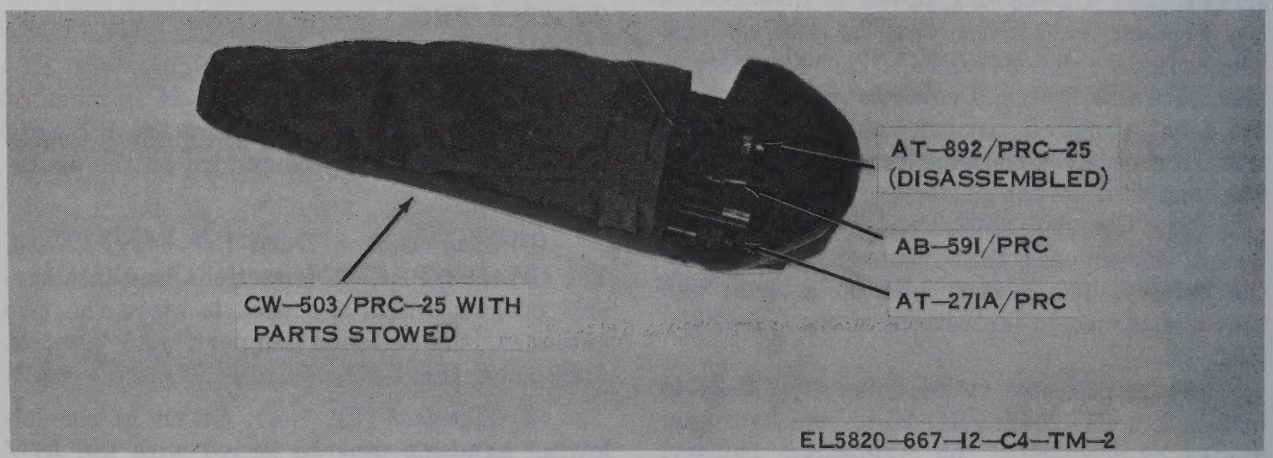


Figure 1-3. Bag, Cotton Duck CW-503/PRC-25, with antennas and handset stowed.

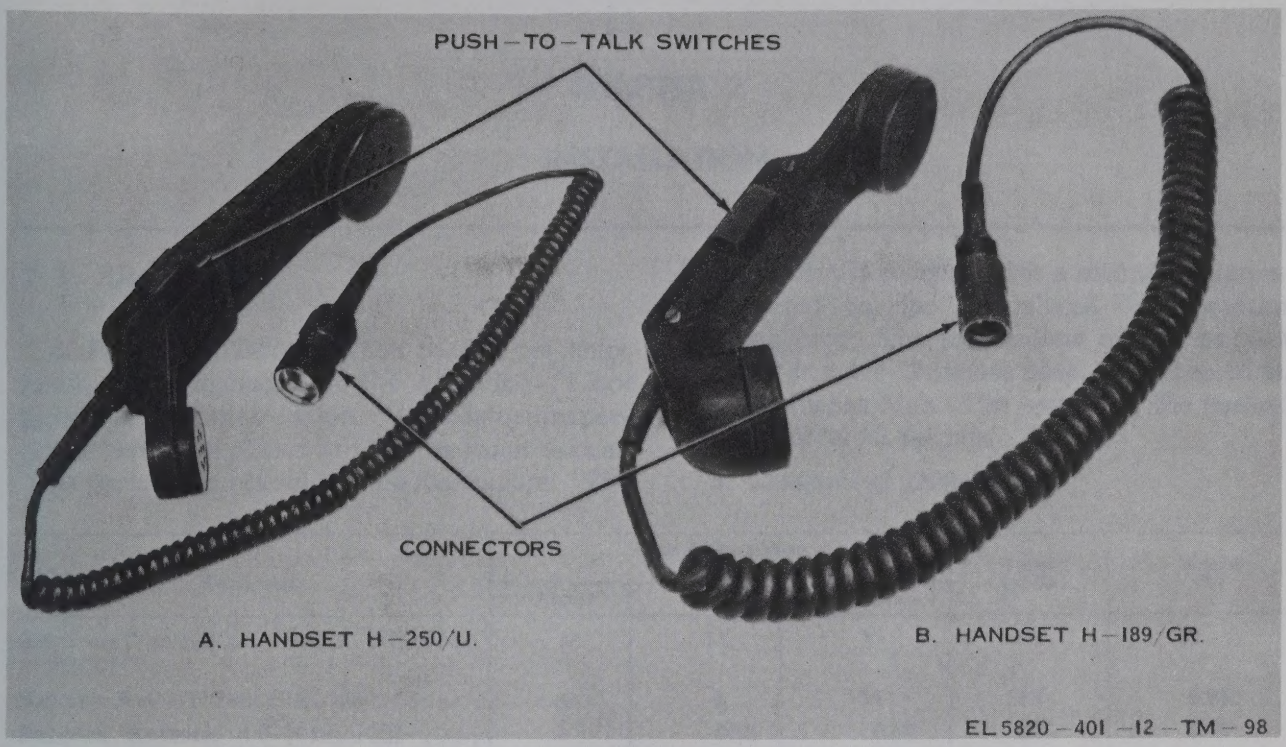


Figure 1-4. Handsets H-189/GR and H-250/U.

(*a*) *Handset H-189/GR.* The H-189/GR contains a dynamic microphone and receiver for transmitting and receiving signals. A push-to-talk switch is mounted in the handle. The connecting cord is retractile and terminates in a five-pin connector.

(*b*) *Handset H-250/U.* The H-250/U is similar to the H-189/GR except that it is lighter and more rugged.

1-8. Additional Equipment Required
(fig. 2-2)

a. Battery, Dry BA-4386/U is not supplied with the AN/PRC-77 but is required for operation of the RT-841/PRC-77. The battery is issued in accordance with requirements in SB 11-6. The battery is provided with a female connector to mate with the battery connector on the RT-841/PRC-77. The battery supplies 3 and 15 volts; the 3-volt output is not used by the RT-841/PRC-77.

b. For artic operation, Battery, Dry BA-398/U may be used. See paragraph 6-2 for details. See also SB 11-576 for authorization and use of cold weather batteries for the AN/PRC-77 and other radios.

CHAPTER 2

INSTALLATION

2-1. Unpacking
(fig. 2-1)

a. Packaging Data. When packed for shipment, the components of the AN/PRC-77 are placed in an inner carton. A moisture-vaporproof barrier is placed around the inner carton. This package is placed in an outer carton. The outer carton is covered with a second moisture-vaporproof barrier and placed in a wooden packing box. The dimensions of the wooden packing box are 17 inches deep, 13 inches wide, and 9¾ inches high. The weight of the packed equipment is 20 pounds.

b. Component Dimensions.

Component	Overall dimensions (in.)			Volume (cu in.)	Weight (lb)
	Height	Width	Depth		
Receiver-Transmitter, Radio RT-841/PRC-77.	4	11	11	484	13
Battery Box CY-2562/PRC-25	4	8	11	132	0.75
Support, Antenna AB-591A/PRC	9	0.75	0.75	50	0.75
Antenna AT-892/PRC-25 (folded)	18.5	1	1.5	28	0.5
Antenna AT-271A/PRC (folded)	17	0.75	.75	9	0.75
Harness, Electrical Equipment ST-138/PRC-25.	19	6	5	520	3
Bag, Cotton Duck CW-503/PRC-25	19	4	6	456	0.75
Handset (H-189/GR or H-250/U)	8	2	3	48	1.2

c. Removing Contents.

Note. When unpacking equipment that is packed only in cartons, omit the procedure given in (1) through (3) below.

(1) Cut and fold back the metal straps.
Caution: Do not pry off the boards. Prying may damage the equipment.
(2) Remove the nails from the top and one side of the wooden packing box with a nailpuller.
(3) Open the moisture-vaporproof barrier that covers the outer carton.
(4) Open the outer carton. Open the second moisture-vaporproof barrier that covers the inner carton.
(5) Remove and open the inner carton.
(6) Remove the corrugated filler.
(7) Remove and open the envelope that contains the technical manuals.
(8) Remove the major and minor components.

2-2. Checking Unpacked Equipment

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

b. Check to see that the equipment is complete as listed on the packing slip. If the packing slip is not available, check the equipment against the components list (para 1-6). Report shortages on SF 364 per AR 735-11-2. Shortage of a minor assembly or part that does not affect proper functioning of the equipment should not prevent use of the equipment.

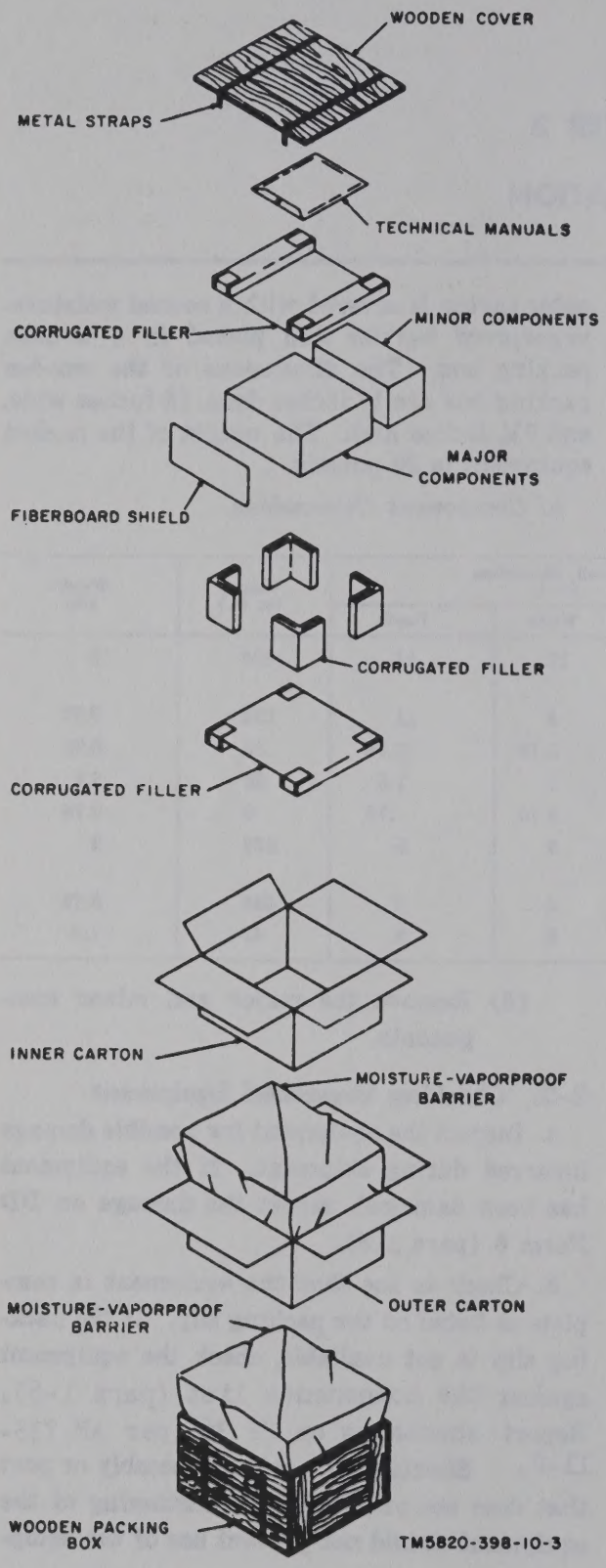


Figure 2-1. Typical packaging.

c. If the equipment has been used or reconditioned, check to see whether it has been changed by an MWO. If the equipment has been modified, the MWO number will appear on the front panel, near the nomenclature plate. Check to see whether the MWO number (if any) and appropriate notations concerning the modification have been entered in the equipment manual. Current MWO's applicable to the equipment are listed in DA Pam 310-7.

2-3. Siting

The AN/PRC-77 operates at low power and on high frequencies; therefore, the location of the equipment greatly affects its operating range (distance). Normally, a line-of-sight range can be expected; that is, if the other station can be seen, satisfactory operation is probable. An intervening hill or a tall building may hamper or prevent contact with other stations. Valleys, densely wooded areas, and low places are poor sites. Location on a hilltop or a tower will increase operating distance. If possible, avoid locations near a source of electrical interference, such as power or telephone lines, radar sets, and field hospitals.

2-4. Installation and Removal of Battery

(fig. 2-2)

a. Stand the RT-841/PRC-77 on a level surface with its front panel facing downward.

b. Release the two clamps by pushing the topmost part of each clamp down and away from the receiver-transmitter case.

c. Remove the CY-2562/PRC-25 and remove the battery.

d. Inspect the radio connector; if it is damaged or loose, the receiver-transmitter must be repaired. Tighten the pressure test screw if it is not sealed with an epoxy (item 4, app F). Tighten the pressure relief valve.

e. Position the new battery connector in line with the radio connector until the two connectors are mated.

f. Install the CY-2562/PRC-25 on the receiver-transmitter case and tighten the two clamps.

NOTES

Remove the battery when the equipment is not in use for more than a day.

Magnesium Battery BA-4386/U does not require refrigeration before its initial use to retain its power. But, when it has been in use over approximately 5 hours (approximately 10 percent of its power used), store the battery in a cool and moisture-free place. This procedure will prolong its useful life.

Battery power may be checked using Test Set Battery AN/PSM-13 (TM 11-6625-823-15; SB 11-623) with Connector, Adapter U-297/PSM-13.

Observe the following procedures to dispose of a worn-out battery:

Do not compact or incinerate the battery.

Do not dispose of the battery in streams, rivers, and oceans, etc. Shipboard users will retain the battery for shore disposal.

Dispose of the battery in a sanitary landfill.

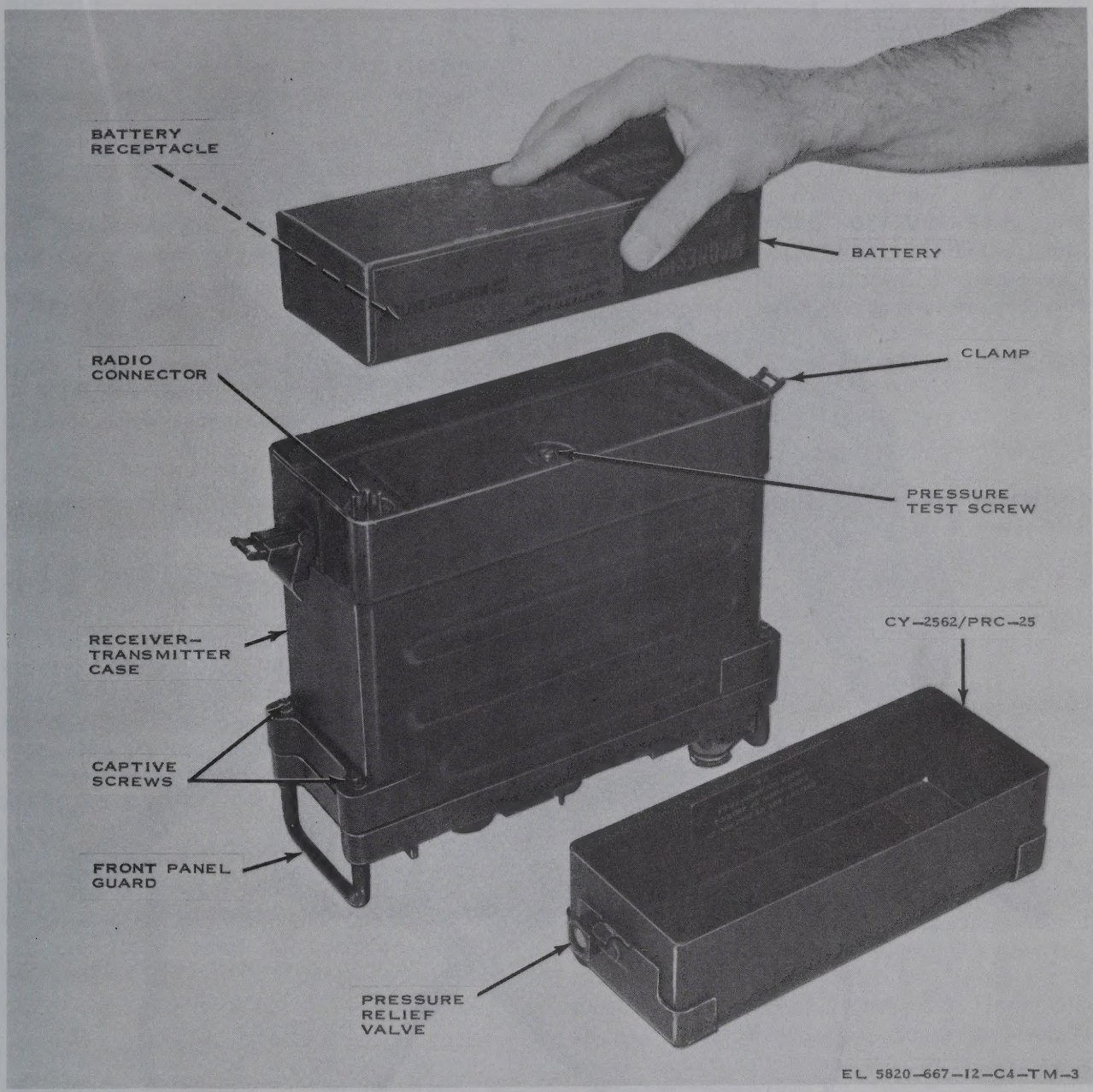


Figure 2-2. Installation of battery in receiver-transmitter.

2-5. Assembly and Installation for Man-Pack Operation

a. Attach the ST-138/PRC-25 (fig. 2-3) to the receiver-transmitter as instructed in (1) through (4) below.

NOTE

Install the battery in the receiver-transmitter before proceeding (para 2-4).

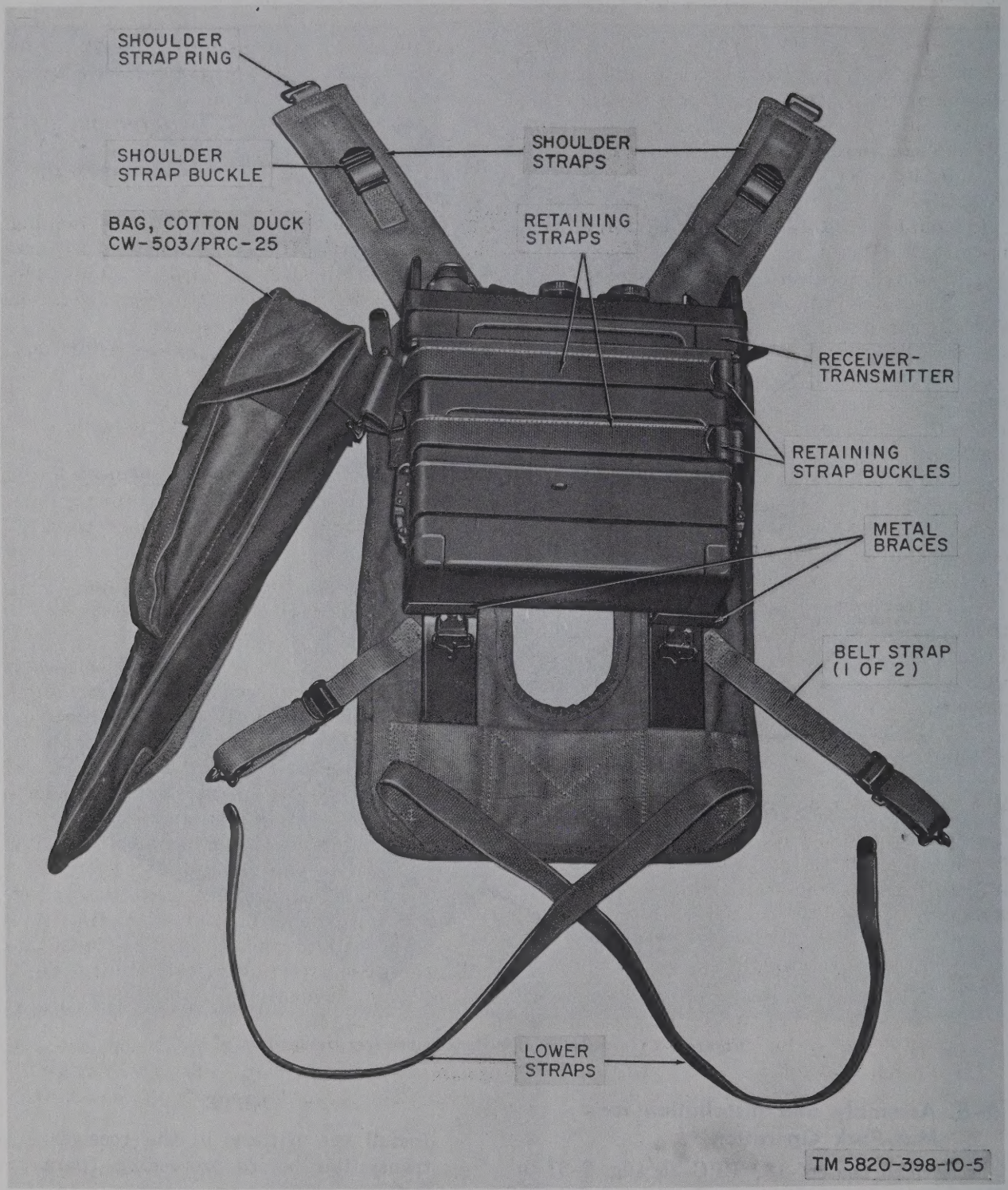


Figure 2-3. Installation receiver-transmitter in ST-138/PRC-25.

(1) Place the ST-138/PRC-25 flat on a level surface with the metal braces facing up.

(2) Place the receiver-transmitter on the ST-138/PRC-25 with its front panel toward the top and the CY-2562/PRC-

25 resting on the metal braces of the ST–138/PRC–25.

(3) Fasten the RT–841/PRC–77 to the ST–138/PRC–25 with the two retaining straps; feed the metal-tipped strap from below, through the center slot on the buckle, and then down through the end slot in the buckle.

(4) Clip the CW–503/PRC–25 to the ST–138/PRC–25.

b. Mount the ST–138/PRC–25 (fig. 2–4) on the operator as follows:

(1) Install the desired antenna (para 2–6).

(2) Connect the H–189/GR to one of the AUDIO connectors on the front panel of the RT–841/PRC–77.

(3) Place the ST–138/PRC–25, with the RT–841/PRC–77 attached, on the operator's back. Place the shoulder straps over the operator's shoulders.

(4) Feed the end of the right lower strap through the right shoulder strap ring. Feed the metal tip of the strap from below, through the center slot in the buckle, and then down through the end slot (fig. 2–3).

(5) Feed the end of the left lower strap through the ring of the left shoulder strap. Feed the metal tip of the strap from below, through the center slot in the buckle, and then down through the end slot in the buckle.

(6) Hook the two belt straps to the combat belt (fig. 2–4).

2–6. Installation of Antennas

Use the long, 10-foot AT–271A/PRC when maximum range is required. Use the short, 3-foot AT–892/PRC–25 when maximum range is not required.

NOTE

If as little as $^1/_{16}$ inch gap is allowed between the top of the whip antenna receptacle and the flat bottom of the antenna, the antenna may break at this point, leaving the threaded portion in the antenna receptacle. A plastic filling has been included among the threads but it may become worn and ineffective in preventing the antenna from unscrewing due to vibration. To safeguard the antenna, periodically tighten it in the antenna receptacle.

a. Antenna AT–271A/PRC.

(1) Check to see that the tip is securely screwed to the top element and that the threaded stud at the other end is securely screwed to the bottom element.

(2) Remove the cover from the whip ANT receptacle.

(3) Screw Support, Antenna AB–591/PRC–25 into the whip ANT receptacle.

(4) Extend the AT–271A/PRC by holding the base section (the heaviest section) and carefully whipping it outward. If all sections are not secure, repeat this procedure, or insert the sections individually by hand.

(5) Screw the extended AT–271A/PRC into the AB–591/PRC–25.

b. Antenna AT–892/PRC–25.

(1) Remove the cover from the whip ANT receptacle.

(2) Screw the blade section securely to the spring base section. Screw the spring base section securely to the whip ANT receptacle.

NOTE

When folding the AT–892/PRC–25, always fold the blade section toward the concave side (↓).

(3) The AT–892/PRC–25 spring base section permits positioning of the antenna at any angle other than vertical to the top of the receiver-transmitter. For best communication, the antenna should be vertical to the ground (A and B, fig. 2–5). When the operator or the transmitter is in a position other than vertical to the ground, the antenna should be adjusted so that it is vertical to the ground. If the vertical position would reveal the operator's position, the antenna can be positioned so that it is horizontal to the ground (C, fig. 2–5). Under this situation, the direction of communication is *broadside* to the antenna.

c. Other Antennas.

(1) For long-distance operation, refer to paragraph 6–3 for information on Antenna Equipment RC–292 and Antenna Group OE–254/GRC.

(2) To detect other radio stations, refer to paragraph 6–4 for information on the use of Antenna, Homing Loop AT–784/PRC.

(3) To use a long-wire antenna, refer to paragraph 6–5 for information on Antenna AT–984/G.



Figure 2-4. Installing AN/PRC-77 for man-pack operation.

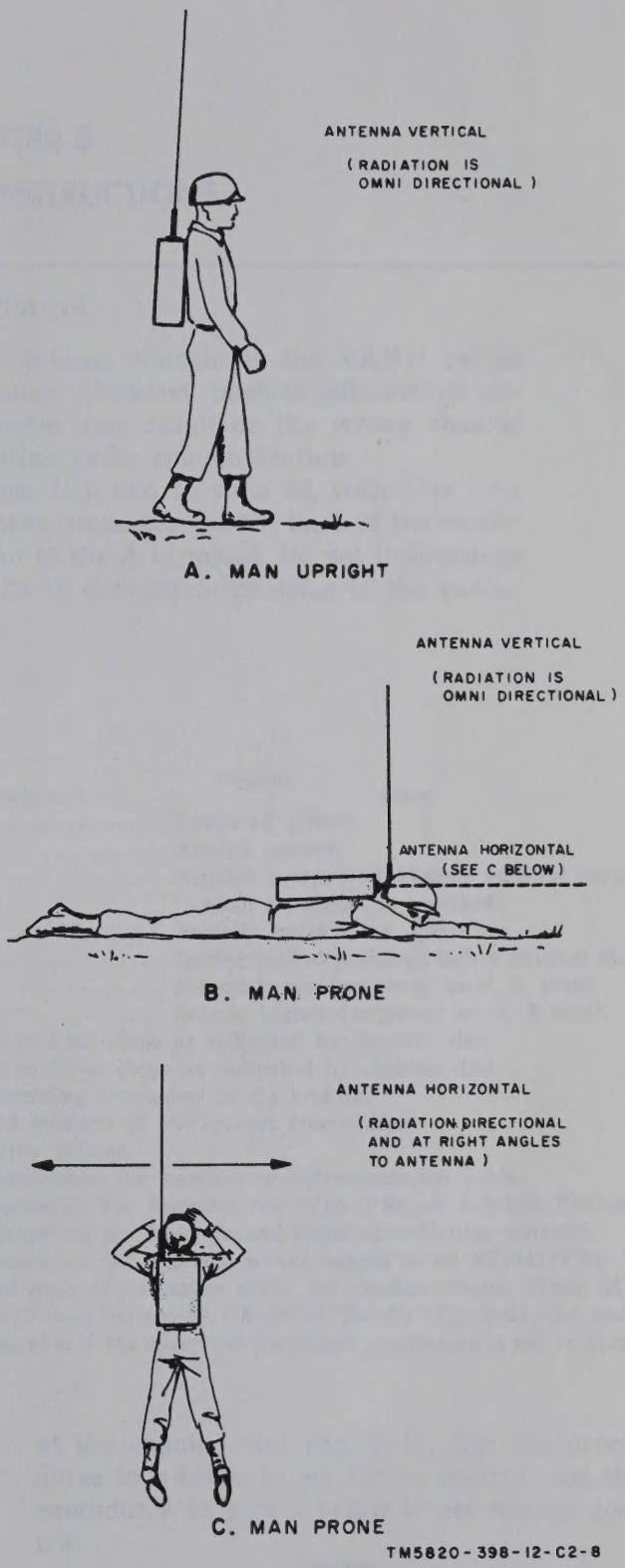


Figure 2-5. Orientation of AT-892/PRC-25 in various positions on user.



CHAPTER 3
OPERATING INSTRUCTIONS

CAUTIONS

1. Do NOT change the mc and kc tuning controls or the BAND switch while the radio is keyed for transmission (handset push-to-talk switch depressed). Damage to modules in the radio may result or the wrong channel frequency may be set up, thus preventing radio communication.

2. Battery power should be between 12.5 and 15 volts dc, with plus (+) applied to the B terminal on the battery connector (at the back of the receiver-transmitter) and minus (−) applied to the A terminal. Dc not interchange these battery polarities; to do so results in damage to modules in the radio.

3–1. Receiver-Transmitter, Radio RT–841/PRC–77, Controls, Indicators, and Connectors
(fig. 3–1)

Control, indicator or connector	*Sw position*	*Function* *Action*
Function switch	OFF	Turns off power.
	ON	Applies power.
	SQUELCH	Applies power and stops rushing noise when no signal is received.
	RETRANS	Permits radio relay operation.
	LITE	Spring-loaded position; lights channel dial.
BAND switch	30–52	Selects lower frequency band, A band.
	53–75	Selects higher frequency band. B band.
Mc tuning control		Tunes radio in 1-mc steps as indicated by channel dial.
Kc tuning control		Tunes radio in 50-kc steps as indicated by channel dial.
REC-TRANS FREQUENCY dial		Indicates operating frequency in mc and kc.
PRESET levers		Permit rapid location of two preset frequencies.
VOLUME control		Varies receiver volume.
AUDIO connectors		Provides connections for handset or retransmission cable.
ANT mount*		Provides connection for Antenna AT–271A/PRC or AT–892/PRC–25.
ANT connector*		Provides connection for fixed ground-plane or vehicular antenna.
POWER connector		Provides connection for external power supply when RT-841/PRC–77 is used as part of vehicular radio set configurations. When RT-841/PRC–77 uses battery in CY-2562/PRC–25 (fig. 2–2), the radio will not operate if the cover for the power connectors is not in place.

*Other antennas may be used. See paragraphs 6–3 and 6–4.

3–2. Presetting Channel Frequencies
(fig. 3–1 and 3–2)

On the mc and kc controls (fig. 3–1) are preset levers that can be set to catch the stops on each control (fig. 3–2). Thus, when two channels are preset, they can be selected without looking at the channel dial (fig. 3–1). Use the procedures in *a* below to set the kc control; use the procedures in *b* or *c* below to set the mc control.

NOTE

When presetting the controls, the two

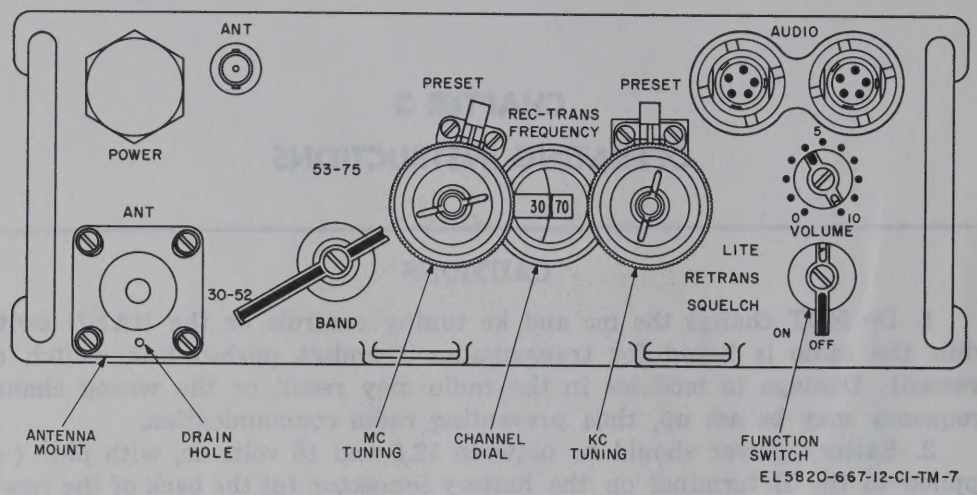


Figure 3–1. Receiver-Transmitter, Radio RT-841/PRC–77, controls, indicators, and connectors.

frequencies to be set must be considered the *lower* and the *higher* frequencies; and the sections of each tuning control as the *inner* (next to the front panel) and the outer sections (fig. 3–2).

a. Presetting Kc Tuning Control. The kc control is set before the mc control (*b* or *c* below). Determine the lower and higher kc frequencies. (*For example:* 35 in 59.35 mc, 70 in 39.70 mc, etc.).

(1) Set the preset lever away from the kc control (A and B, fig. 3–2).

(2) Set the kc control so that the *lower* frequency appears in the channel dial.

(3) Position the preset lever forward against the control (C, fig. 3–2) and loosen the wingnut on the control.

(4) Pull up on the lower section of the control and turn it counterclockwise until the stop on the lower section strikes the preset lever. Tighten the wingnut.

(5) Position the preset lever away from the control.

(6) Turn the control until the higher frequency appears in the channel dial (both sections move).

(7) Loosen the wingnut and position the preset lever forward against the control.

(8) Without disturbing the setting of the lower section, pull on the upper section and turn it clockwise until its stop strikes the preset lever.

(9) Keeping the upper section against the preset lever, tighten the wingnut.

(10) Check the settings for the lower and higher kc frequency settings by turning the control counterclockwise to the stop for the lower kc frequency, and clockwise to the stop for the higher kc frequency.

(11) Set the mc control (*b* below).

b. Presetting Mc Tuning Control. The mc control is set after the kc control (*a* above). Determine the assigned lower and higher mc frequencies. (For example: 59 in 59.35 mc, 39 in 39.70 mc, etc.)

(1) *Presetting mc frequencies in same band.* The procedure for presetting the lower and upper sections of the mc control for mc frequencies *that are in the same band* are the same as those given for the kc control in *a* above. That is, the lower mc frequency in the band is set with the lower section of the control; and the higher mc frequency in the same band is set with the upper section.

(2) *Presetting mc frequencies in different bands.* Note that there are 23 positions of the control in each band: from 30 through 52 in band A; from 53 through 75 in band B.

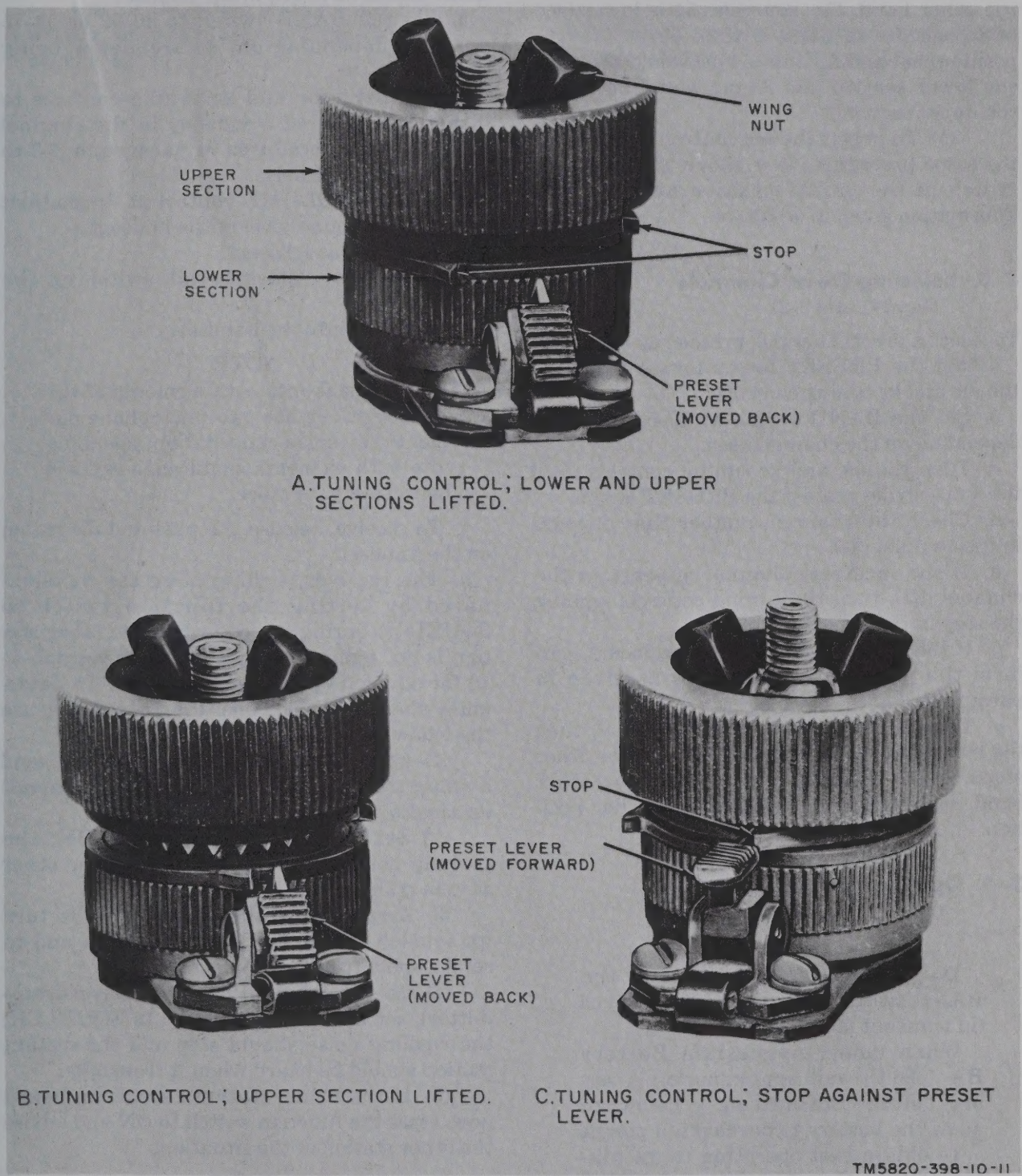


Figure 3-2. Presetting mc and kc tuning controls.

(*a*) When presetting the mc control for frequencies that are in *different* bands, always set the lower section to that mc frequency that is *lower in its band* than the mc frequency in the other band. *For example:* 54 is lower (second position) in band B than 33 mc (fourth position) in band A; thus, 54 mc would be set on the lower section and 33 mc would be set on the upper section.

(*b*) To preset the mc control sections, use the same procedures in *a* above with the band switch in the proper position and with the information given in (*a*) above.

3–3. Selecting Preset Channels

(fig. 3–1 and 3–2)

To select a preset channel, proceed as follows:

a. Set the PRESET levers forward (toward the mc and kc tuning controls).

b. Set the BAND switch at 30–52 or 53–75, depending on the channel used.

c. Turn the mc and kc tuning controls until the stops strike against the PRESET levers.

d. Check the channel number that appears in the channel dial.

e. If the incorrect channel appears in the channel dial, turn the tuning controls against the stop in the opposite direction.

f. If the incorrect channel still appears, perform the presetting procedures as given in paragraph 3–2.

g. To select the other preset channel, turn the mc and kc tuning controls against the other stops. If the preset frequency is in the other band, set the BAND switch at the other position.

3–4. Operating Procedure

(fig. 3–1).

NOTES

Do not change frequencies or the BAND switch while the radio is keyed (in transmit mode).

When using magnesium Battery BA–4386/U, wait approximately 1 second before transmitting (*e* below) to allow the battery to develop full power.

To obtain best operating range (distance), keep the whip antenna vertical to the ground. See figure 2–5 for various positions the user can use to keep the short antenna vertical.

a. Set the function switch to ON. A rushing noise should be heard in the handset.

b. Set the BAND switch to 30–52 or 53–75 position, depending on the frequency being used.

c. Turn the mc and kc tuning controls to display the desired frequency in the channel dial. See the procedures in paragraph 3–3 to select preset channels.

d. Set the VOLUME control at 4; readjust for a desired sound level in the handset.

e. Transmit as follows:

(1) Press the push-to-talk switch on the handset.

(2) Speak into the handset.

NOTE

Do not speak into both elements of the H–138(*)/U. It has two microphone elements for noise cancellation; speaking into both elements simultaneously will cancel out your voice.

f. To receive, release the push-to-talk switch on the handset.

g. The receiver rushing noise can be eliminated by setting the function switch to SQUELCH during periods when the other station is not transmitting. Refer to paragraph 3–10 for squelch operation conditions. To determine whether squelch operation is possible, use the following procedures:

(1) Arrange for the distant station to send a short transmission while operating *without its squelch.*

(2) Set the function switch to ON; the rushing noise should be heard until the other station transmits.

(3) Arrange with the other station to turn its squelch switch to the ON position and to send a short transmission.

(4) On the RT–841/PRC–77 (receiver-transmitter), set the function switch to SQUELCH; the rushing noise should stop and the distant station should be heard when it transmits.

(5) If the other station cannot be heard now, reset the function switch to ON and advise the other station of the situation.

NOTE

The failure of either station to receive

transmissions from the other may indicate one of the following:

The distance between the two stations is too great.

One of the other stations has not set the controls to transmit the 150-cps squelch tone.

The squelch circuit of either radio station is defective.

Exercise the function switch by setting it in its various positions a few times.

(6) If either station is moving about, leave the function switch in the ON position.

at both stations until it has been determined (by using the procedures in (1) through (5) above) that reception can be accomplished with the function switch at SQUELCH.

3-5. Stopping Procedure
(fig. 1-2 and 1-3)

a. To turn off the receiver-transmitter, set the function switch to OFF.

b. If the AT-271A/PRC was used, disassemble it as follows:

(1) Unscrew the AT-271A/PRC from the AB-591A/PRC.

(2) Beginning with the top section, pull out each section from the next section and fold it along the side of the next lower section.

(3) Unscrew the AB-591A/PRC from the antenna mount.

c. Store the handset, *both* antennas, and the AB-591A/PRC in the CW-503/PRC-25.

d. Close the flaps on the CW-503/PRC-25.

3-6. Recognition and Identification of Jamming

Under real or simulated tactical conditions, the receiver may be jammed by the enemy. Jamming is easily done by transmission of a strong signal on the frequency being used, which makes it difficult or impossible to hear the desired signal. Unusual noises or strong interference heard on the receiver may be enemy jamming, signals from a friendly station, noise from a local source, or a defective receiver. To determine whether the interference is originating in the receiver, disconnect the antenna. If the interference continues, the receiver is defective.

3-7. Anti-jamming

When jamming of a channel is first noticed, notify your superior officer immediately and continue to operate the equipment. To provide maximum intelligibility of jammed signals, try the suggestions given in *a* through *c* below.

a. The effects of enemy jamming may be reduced by placing the equipment so that nearby obstructions act as a screen in the direction of probable sites of enemy jamming transmitters. This screen action may also reduce the transmitted signal strength toward the enemy and thereby make it more difficult for him to intercept your signals. If possible, try several different locations within the designated area and stay at the one where jamming is minimum.

b. Vary the VOLUME control. The level of the desired signal may be raised enough to be distinguished from the jamming signal.

c. If the procedures in *a* and *b* above do not provide sufficient signal separation for operation, request change to an alternate frequency and call sign.

3-8. Operating Procedures Under Arctic Conditions

When operating the AN/PRC-77 under arctic conditions, Battery, Dry BA-398/U (para 6-2) must be used instead of the BA-386/PRC-25 or BA-4386/U. The BA-398/U (fig. 6-3), which is worn beneath the operator's parka, allows operation in temperatures to −63° F. (−53° C.). Prior to operation in extreme temperatures, check to see that a coating of silicon grease has been applied to the neoprene rubber O-ring of the audio connectors. (See SB 11-576 for authorization of BA-398/U.)

3-9. Homing Operation

Use Antenna, Homing Loop AT-784/PRC (TM 11-5985-284-15) to provide the AN/PRC-77 with facilities for homing operation. Refer to paragraph 6-4 for operation of the AT-784/PRC with the AN/PRC-77.

3-10. Conditions for Squelch and Nonsquelch Operation

The explanations and squelch operating conditions in *a* through *d* below are applicable to the squelch operation in paragraph 3-4*g*.

a. When the function switch of the RT-841/PRC-77 is set to ON, a rushing noise is heard in the handset. The rushing noise stops when the RT-841/PRC-77, or another transmitter operating on the same frequency is turned on.

b. When the function switch is set to SQUELCH, no sound is heard in the handset until the RT-841/PRC-77 or another transmitter operating on the same frequency, is turned on, provided the other transmitter transmits a 150-cps squelch signal when it is turned on.

Radios provided with this feature are given in *c* below. When the RT-841/PRC-77 is turned on for transmission with its function switch set to SQUELCH, a 150-cps squelch signal is transmitted; it is heard as a sidetone buzz in the handset.

c. Communication with the function switch set to SQUELCH is possible when other stations in the radio net are using one of the following radio sets and *if* these radios *also* have their squelch switches in the *on* positions. In general, when one of the following radio sets has its squelch switch set to the 150-cps squelch function, the other radio sets in the net must be set similarly.

(1) Radio sets that are equipped with the RT-505/PRC-25, such as Radio Sets AN/PRC-25, AN/VRC-53, AN/VRC-54, and AN/GRC-125.

(2) Radio sets that are equipped with the Receiver-Transmitter, Radio RT-841/PRC-77, such as Radio Sets AN/PRC-77, AN/VRC-64, and AN/GRC-160. The RT-841/PRC-77 looks like and operates identically to the RT-505/PRC-25.

(3) Radio sets that are equipped with the Receiver-Transmitter, Radios RT-246/VRC, RT-524/VRC, or Receiver Radio R-442/VRC, such as Radio Sets AN/VRC-12, and AN/VRC-43 through AN/VRC-49, and AN/VRC-54. The 150-cps squelch tone is transmitted from these radios when their squelch switch is set to NEW ON, NEW OFF, and OLD OFF. When the 150-cps squelch signal is sent from another radio set, these radio sets will respond when their squelch switch is set to NEW ON.

(4) When communication is with Radio Sets AN/ARC-54 and AN/ARC-131, the squelch switch of these radio sets must be set to TONE.

d. To communicate with radio sets other than those listed in *c* above, the function switch of the RT-841/PRC-77 must be set to ON.

3-11. System Application (fig. 3-3)

Figure 3-3 shows various frequency-modulated (FM) radio sets with which the RT-841/PRC-77 can communicate within the 30-75.95-megacycle (mc) band. The chart below lists the frequency ranges, the channel spacing of the radio sets, and their associated publications. All radios listed, except those in which preset crystals are required, can tune to any frequency within its operating range. Take note of the channel spacing in kilocyles. *For example,* communication with the Radio Set AN/PRC-6 can occur on 50.00 mc, 50.20 mc, 50.40 mc, etc.

Radio Sets	*Frequency Range (mc)*	*Channel spacings every*	*Publication*	*Remarks*
AN/PRC-77[a]	30-75.95	50 kc	TM 11-5820-667-12	
AN/VRC-53, AN/VRC-64, AN/GRC-125, AN/GRC-160.[a]	30-75.95	50 kc	TM 11-5820-498-12	
AN/VRC-54[a]	30-75.95	50 kc	TM 11-5820-401-12	Includes AN/VRC-46, -24, and AN/PRC-25.
AN/VRC-55[b]	30-75.96	50 kc	TM 11-5820-401-12	
AN/VRC-12, AN/VRC-43 through AN/VRC-49.[a]	30-75.95	50 kc	TM 11-5820-401-12	
AN/GRC-10, AN/GRC-39, and AN/GRC-40	50-70.90	100 kc	TM 11-614	
AN/PRC-25[a]	30-75.95	50 kc	TM 11-5820-398-12	
AN/PRC-6	47-55.4	200 kc	TM 11-296	Channels provided by preset crystals.
AN/PRC-9	30-38.90	100 kc	TM 11-5820-292-10	
AN/PRC-10	38-54.9	100 kc	TM 11-5820-292-10	
AN/PRC-28	30-42	100 kc	TM 11-5820-292-10	
AN/ARC-44 (modified)	24-51.90	100 kc	TM 11-5821-204-12	
AN/ARC-54[a]	30-69.95	50 kc	TM 11-5821-244-12	
AN/ARC-131[a]	30-75.95	50 kc	TM 11-5820-670-12	

Radio Sets	*Frequency Range (mc)*	*Channel spacings every*	*Publication*	*Remarks*
AN/ARC-114 [a]	30–75.95	50 kc	TM 11-5821-670-12	
AN/ASC-10(V) [a]	30–69.95 or 30–75.95	50 kc	TM 11-5821-276-15	Includes either AN/ARC-54 or AN/ARC-131.
AN/ASC-11 [b]	30–75.95	50 kc	TM 11-5821-279-12	
AN/ASC-15 [a]	30–75.95	50 kc	TM 11-5821-285-12	Includes AN/ARC-131.
Receiver-Transmitter RT-67/GRC in:	27–38.90	100 kc		
AN/GRC-5, AN/GRC-6.			TM 11-284	
AN/VRQ-2			TM 11-287	
AN/VRC-9			TM 11-286	
AN/VRC-14			TM 11-291	
AN/VRC-17			TM 11-611	
AN/VRC-21			TM 11-642	
Receiver-Transmitter RT-68/GRC in:	38–54.90	100 kc		
AN/GRC-7, AN/GRC-8			TM 11-284	
AN/VRQ-3			TM 11-287	
AN/VRC-10			TM 11-286	
AN/VRC-15			TM 11-291	
AN/VRC-18			TM 11-611	
AN/VRC-22			TM 11-642	
Receiver-Transmitter RT-70/GRC in:	47–58.40	100 kc	TM 11-290	
AN/GRC-5 through AN/GRC-8.			TM 11-284	
AN/VRC-7			TM 11-285	
AN/PRR-9	47–57	100 kc	TM 11-5820-549-12	P/o squad radio; can only receive; preset crystals.
AN/PRT-4	47–57	100 kc	TM 11-5820-549-12	P/o squad radio; can only transmit; preset crystals.
AN/PRT-4A [a]	47–57	100 kc	TM 11-5820-549-12	P/o squad radio; can only transmit; preset crystals.
AN/GRC-163	30–75.95	50 kc	TM 11-5820-713-15	Includes AN/VRC-47.
AN/TSC-61A [b]	30–75.95	50 kc	TM 11-5895-469-15-1	
AN/TSQ-70A [b]	30–75.95	50 kc	TM 11-5895-579-12	
AN/TSQ-71A [b]	30–75.95	50 kc	TM 11-5895-474-12	
AN/FSQ-75(V) [b]	30–75.95	50 kc	TM 11-5895-590-10	

[a] These radio sets have the 150-cps squelch feature in their receiver-transmitters and receivers that make them compatable with the RT-841/PRC-77 for squelch operation. Refer to paragraph 3-10 for squelch details.

[b] These are radio configurations in which the AN/VRC-46 or AN/VRC-49 is a component.

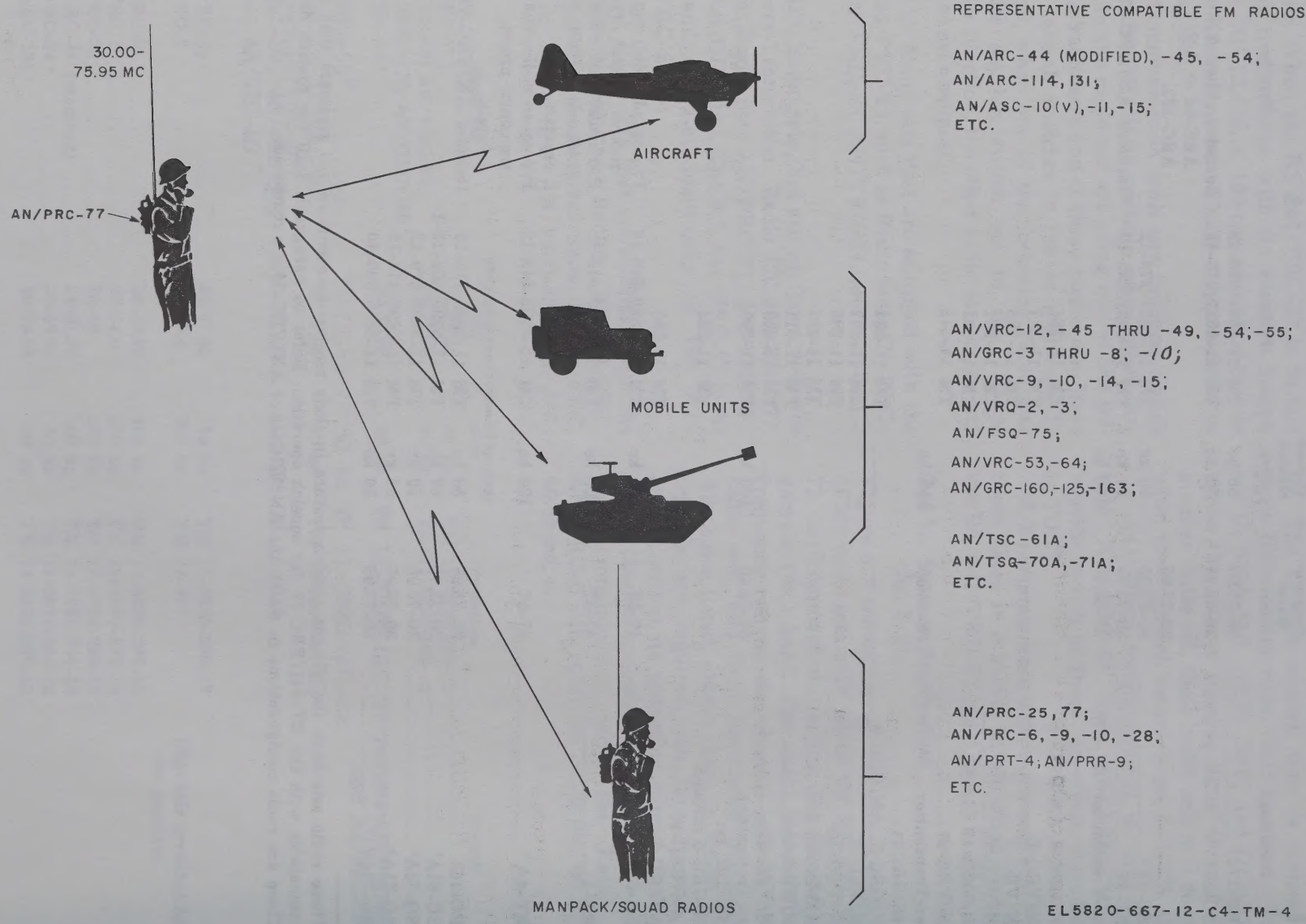


Figure 3–3. Typical radio systems compatible with AN/PRC–77.

CHAPTER 4

OPERATOR'S MAINTENANCE INSTRUCTIONS

Section I. PREVENTIVE MAINTENANCE

4–1. Scope of Operator's Maintenance

No special tools or test equipment are required for operator's maintenance of the AN/PRC–77. Trichloroethane (item 1, app F) is required for cleaning (para 4–3). Operator's maintenance includes the following:

a. Preventive maintenance (para 4-2, table 4–1).

b. Replacing the battery (para 2–4).

c. Troubleshooting (para 4–4 and 4–5).

4–2. Preventive Maintenance, General

Preventive maintenance is the systematic care, servicing, and inspection of equipment to prevent occurrence of trouble, to reduce downtime, and to assure that the equipment is serviceable. Preventive maintenance checks and services (PMCS) defines procedures to be performed at specific intervals and under certain conditions (table 4–1).

a. Before you operate perform your before (B) PMCS.

b. While you operate, perform your during (D) PMCS. The recording and reporting of your during (D) PMCS is done while performing the after (A) PMCS.

c. After you operate, perform your after (A) PMCS.

d. If the equipment was not used during a week, perform the (B), (D), and (A) PMCS together with the weekly (W) PMCS.

e. If the equipment fails to operate, try troubleshooting (para 4–4 and 4–5). If the equipment still fails to operate, submit it to higher maintenance for repair using the proper forms (TM 38–750).

f. The *Item No.* in table 4–1 shall be used as a source of item numbers for the *TM Number* column on DA Form 2404 (Equipment Inspection and Maintenance Worksheet) in recording the results of the PMCS.

g. If the equipment must be kept in constant operation, check and service only those items that can be checked and serviced without disturbing operation. Make the complete checks and services when the equipment can be shut down.

Table 4-1. Operator's/Crew Preventive Maintenance Checks and Services

NOTE

Within the designated interval, these checks are to be performed in the order listed.

B- BEFORE OPERATION **D- DURING OPERATION** **A- AFTER OPERATION** **W- WEEKLY**

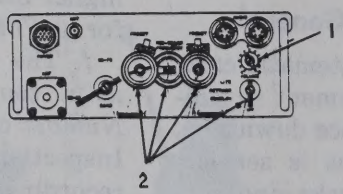
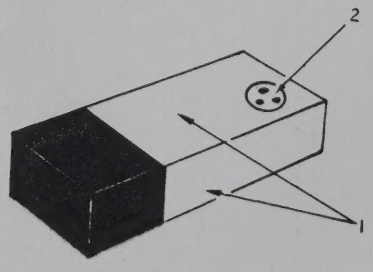
ITEM NO.	INTERVAL B	D	A	W	ITEM TO BE INSPECTED	PROCEDURES CHECK AND HAVE REPAIRED OR ADJUSTED AS NECESSARY	FOR READINESS REPORTING EQUIPMENT IS NOT READY AVAILABLE IF:
1	o				Completeness	All components are on hand to make the radio operation (appx B); that is to communicate.	Operational component(s) is (are) not available.
2		o			Operation	While operating the radio, check the following features: a. Switches and controls (1) and (2) are not loose in their shafts. b. VOLUME control (1) does not bind and there is no interruption of received signal as control is rotated through its range.  c. Squelch operation is satisfactory (para 3-10), if used. d. Communications is not intermittent. e. Under normal conditions (based on experience with antenna being used, terrain, distance to other radios, assigned operating frequencies, etc.), communication can be conducted.	e. Communication cannot be conducted under normal conditions.
3			o		Battery	a. Remove battery (para 2-4) if radio set will not be used again that day or longer. b. Check to see that the battery case (1) is not swollen (bulging), or leaking, and that the contact receptacle (2) is not damaged. 	

Table 4-1. Operator's/Crew Preventive Maintenance Checks and Services - Continued.

NOTE
Within the designated interval, these checks are to be performed in the order listed.

B- BEFORE OPERATION **D- DURING OPERATION** **A- AFTER OPERATION** **W- WEEKLY**

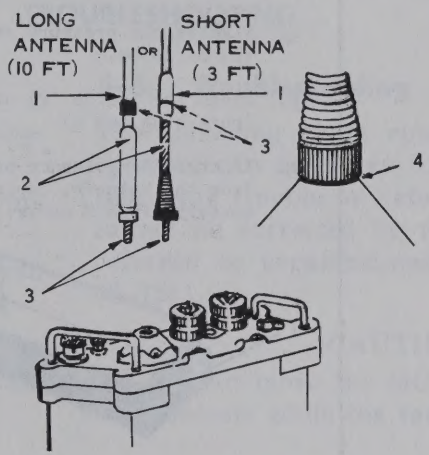
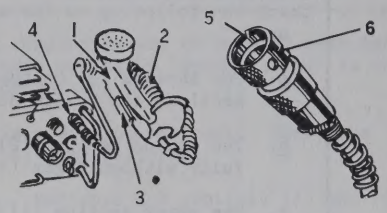
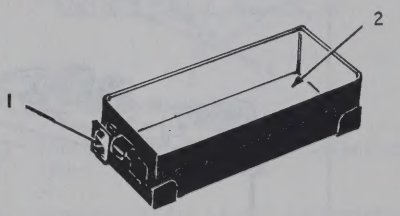
ITEM NO.	INTERVAL B	D	A	W		ITEM TO BE INSPECTED	PROCEDURES CHECK AND HAVE REPAIRED OR ADJUSTED AS NECESSARY	FOR READINESS REPORTING EQUIPMENT IS NOT READY/AVAILABLE IF:
4				o		Antennas	Check the following on the antenna being used: a. The threads (3) on the ends of the sections can be are not damaged. b. The spring section (2) screwed down fully without a gap (4). c. The upper section (1) and spring section (2) can be screwed together fully. 	
5				o		Handset	Perform the following: a. Check to see that: (1) Handset case (1) is not cracked. (2) Cord (2) is not cut, wires are not exposed, and it coils up. (3) Switch cover (rubber) (3) is in place and not cut. (4) O-ring (5) is in place and is not loose in its groove. (5) Handset connector locks firmly on radio connector (4). b. Clean connector (6) contacts (para 4-3d).	

Table 4-1. Operator's/Crew Preventive Maintenance Checks and Services - Continued.

NOTE

Within the designated interval, these checks are to be performed in the order listed.

B- BEFORE OPERATION **D-** DURING OPERATION **A-** AFTER OPERATION **W-** WEEKLY

ITEM NO.	INTERVAL B	D	A	W		ITEM TO BE INSPECTED	PROCEDURES CHECK AND HAVE REPAIRED OR ADJUSTED AS NECESSARY	FOR READINESS REPORTING EQUIPMENT IS NOT READY/AVAILABLE IF:
							HANDSET CONNECTOR 	
6				o		CY-2562/PRC-25	Perform the following: a. Tighten the pressure relief valve (1) if loose. b. Clean the inside (2) of the cover (para 4-4a and b). c. If there is evidence of leakage from the battery, replace the battery (item 2 above). 	

4-3. Cleaning

The surface of the equipment should be clean; that is, there should be no dirt, grease, oil or fungus on the surfaces.

WARNING

The fumes of trichloroethane (item 1, app F) are toxic. Provide thorough ventilation whenever used. DO NOT USE NEAR AN OPEN FLAME. Trichloroethane is not flammable, but exposure of the fumes to an open flame or hot metal surface forms highly toxic phosgene gas.

a. Remove dust and dirt with a clean cloth. If dirt is difficult to remove, dampen the cloth with water; soap may be used for more effective cleaning.

b. Remove grease, oil, fungus, and ground-in dirt with a cloth dampened (not wet) with trichloroethane.

c. Clean the canvas items (CW-503/PRC-25 and ST-138/PRC-25 (fig. 2-3)) with a brush moistened with trichloroethane.

d. Clean the contacts of the RT-841/PRC-77 AUDIO connector (fig. 3-1) and the handset connector (fig. 1-4) with a pencil eraser.

Section II. TROUBLESHOOTING

4-4. Visual Inspection

a. When the equipment fails in communication check the following items:

(1) Switches and controls are set correctly (para 3-5).

(2) The handset and antenna are secured to the receiver-transmitter.

b. If the above procedures do not clear the trouble, proceed to the troubleshooting chart (para 4-5).

4-5. Troubleshooting

The following chart contains procedures an operator can do to try to restore communication. Any trouble or defective equipment that cannot be corrected by the operator shall be referred to organizational maintenance (TM 38-750).

CAUTION

Do not move the MC and KC tuning controls while the radio is keyed.

Malfunction	Probable Cause	Corrective action
1. Rushing noise is not heard when function switch is set to ON.	*a.* POWER connector (item 13, fig. 5-2) is not tightened.	a. Tighten POWER connector.
	b. Defective battery (fig. 2-2).	*b.* Perform the following: (1) Set function switch to LITE; the dial lamp should light. (2) Key the receiver-transmitter and talk sidetone should be heard. (3) If neither of above indications is obtained, replace the battery (para 2-4) and repeat (1) and (2) above.
2. Rushing noise does not stop when function switch is set to SQUELCH.	Defective receiver-transmitter.	Rotate MC and KC controls back and forth a few times.

Malfunction	Probable Cause	Corrective action
3. Communication cannot be conducted with distant terminal on assigned frequency; sidetone is heard on transmission.	*a.* Defective receiver-transmitter.	a. Perform the following: (1) Rotate the MC and KC controls back and forth a few times. (2) Try alternate frequencies.
	b. Radio is located in poor location.	*b.* Move to another location; even a few feet may help. Set the antenna vertical.
	c. The antenna is loose in its receptacle.	*c.* Screw the antenna down fully.
	d. The distance to the next radio terminal is too great for the short 3-foot Antenna AT-892/PRC-25 (fig. 1-2).	*d.* Install the 10-foot Antenna AT-271A/PRC (para 2-6*b*).
4. Unable to communicate in squelch mode (para 3-4*g*) (function switch in SQUELCH position).	*a.* Distant radio is not compatible.	*a.* If radio with which you are trying to communicate in squelch mode is not one of those identified in footnote *a* of the radios listed in paragraph 3-11, you must communicate without squelch by setting the function switch to ON.
	b. Distant radio is compatible for squelch mode operation.	*b.* If the distant radio is using RT-246/VRC or RT-524/VRC, the SQUELCH switch can be set in any position except OLD ON. If another radio, the 150 cps squelch tone must be switched on.
	c. Radio is located in poor location.	*c.* Move to another location; even a few feet may help.
5. Reception satisfactory; on transmission, motorboating is heard.	Defective battery.	Replace battery (para 2-4).

CHAPTER 5

ORGANIZATIONAL MAINTENANCE

Section I. GENERAL

5-1. Scope of Organizational Maintenance

Organizational maintenance includes preventive maintenance (para 5-3 and table 4-1) and troubleshooting (para 5-4, 5-5, and 5-6).

5-2. Tools, Materials, and Test Equipment Required

a. Multimeter AN/URM-105.

b. Tool Kit, Electronic Equipment TK-101/G.

c. Trichloroethane (item 1, app F).

d. Silicone Compound (item 2, app F).

e. Graphite Grease, non-seizing compound (item 3, app F).

f. Epoxy (item 4, app F).

g. Cleaning cloth.

Section II. PREVENTIVE MAINTENANCE

5-3. Organizational Preventive Maintenance Checks and Services, General

Preventive maintenance is the systematic care, inspection, and servicing of equipment to maintain it in serviceable condition, prevent breakdowns, and assure maximum operational capability. Organizational preventive maintenance checks and services (PMCS) are performed quarterly.

a. Quarterly PMCS on the equipment will be scheduled in accordance with the procedures specified in TM 38-750, and performed as indicated in table 5-1.

b. The *Item No.* in table 5-1 shall be used as a source of item numbers for the *TM number* column on DA Form 2404 (Equipment Inspection and Maintenance Worksheet) in recording the results of the PMCS.

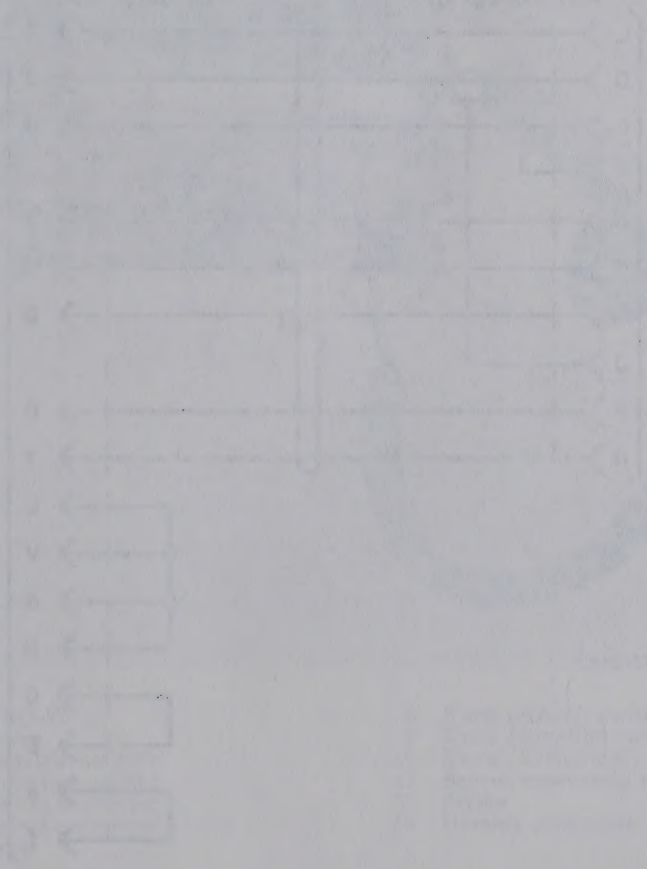
c. If the equipment fails to meet the criteria in the *Procedures* column of the table, report the failure in accordance with the procedures specified in TM 38-750.

Table 5-1. Organizational Preventive Maintenance Checks and Services—Quarterly Schedule

Item No.	Item to be inspected	*Procedure* Check for and have repaired or adjusted as necessary
1	Completeness	Check to see that all AN/PRC-77 components are on hand (app B) or are accounted for (being repaired and/or requisition).
2	Metal surfaces	Remove fungus, rust and corrosion. Spot paint bare metal spots. Refer to SB 11-573 and TB 43-0118 for painting instructions.
3	Handset	*a.* The O-ring in the cable connector is not loose or missing. *b.* Apply a thin coating of silicone compound (item 2, app F) to the O-ring (not to the connector contacts).
4	RT-841/PRC-77 (fig. 3-2)	*a.* The clamps are not damaged and hold the CY-2562/PRC-25 securely to the radio case. *b.* The pressure test screw is in place and epoxy (item 4, app F) is applied over the edge of the screw.

Table 5–1. Organizational Preventive Maintenance Checks and Services—Quarterly Schedule—Continued

Item No.	Item to be inspected	*Procedure* Check for and have repaired or adjusted as necessary
		c. Observe the case to see if there is any evidence of bulging (due possibly to gas exploding inside the case (para 1–7*a*(3)). *d.* Check the following front panel parts (fig. 5–2): (1) Electrical connector cover (4, 5, and 6) are attached to the front panel and each cover fits securely on its connector. (2) The dial locks (7) function to lock and release the MC and KC controls (fig. 3–1). *e.* Clean out the whip antenna receptacle in the antenna mount (fig. 3–1). Clean out the small drain hole near the base of this antenna mount leading to the threaded antenna receptable. *f.* Loose the front panel captive screws (fig. 2–2), separate the front panel and chassis from the case, and perform the following checks: (1) Using lung power, blow out all parts on both sides of the case (to get rid of gasses that may have accumulated). (2) Inspect the battery connector for the following: (*a*) A rubber gasket (shaped similarly to the metal ring around the battery connector hole RT–841/PRC–77 case) must be installed on the radio connector. It must be undamaged, be seated flush with the bottom of the connector (inside the four connector mounting screws), and flush with the body of the connector. (*b*) The two O-rings on the radio connector must be installed and undamaged; that is, they must not be sheared, and each O-ring must be seated, under tension, in its groove. (*c*) The three radio connector pins are not bent or loose, or otherwise damaged. (Some slight pin movement is expected.) (3) Reinstall the chassis in the case; tighten the three captive screws. There should be no gap or space between the edges of the case and the front panel chassis.
5	CY–2562/PRC–25 (fig. 2–2)	*a.* Tighten the pressure relief valve, which *must* be installed (para 1–7*a*(3)). *b.* Apply a light pressure of air to both sides of the pressure relief valve; air should not go through the valve when applied from the outside of the case and should when applied from inside the case. *c.* Clean out the CY–2562/PRC–25 (para 4–3).
6	AT–892/PRC–25 (fig. 1–2)	*a.* The bottom section holds the upper section firmly in position when the upper section is bent at various angles. *b.* Apply a thin coat of graphite grease (item 3, app F) to the threaded connector.
7	AB–591A/PRC (fig. 1–2)	*a.* The unit is not damaged or distorted. *b.* Clean out the threaded receptacle and apply a thin coat of graphite grease (item 3, app F) to the threads on both ends of the unit.
8	AT–271A/PRC (fig. 1–2)	*a.* The wire running through the sections is not broken. There is no water in the sections. *b.* When fully extended and assembled, each section fits into the next section. *c.* The tip cap is in place. *d.* The threaded connector is securely attached to the bottom section. *e.* Apply a thin coat of graphite grease (item 3, app F) to the threaded connectors.
9	ST–138/PRC–25 (fig. 1–2)	*a.* All metal parts are secured to the canvas assembly. *b.* Canvas areas are not torn and all straps are attached to the canvas assembly.



Section III. TROUBLESHOOTING

5–4. Troubleshooting

a. Visual Inspection. When equipment failure occurs, inspect the equipment carefully for obvious defects. This procedure will save time and may prevent further damage. If visual inspection does not reveal trouble, proceed to the equipment performance checklist (*b* below). Make the following visual checks:

(1) Tightness of the antenna in the antenna mount. The antenna should be screwed completely into the radio receptacle.

(2) Seating of the handset connector in the AUDIO connector. The O-ring should be in the connector and should not be loose.

(3) Check the receptacle on the battery (fig. 2–2) to see if wires are broken or the connector is damaged.

(4) Check the handset connector as follows:

(*a*) Using a *soft* tool (such as a piece of wood), press in each pin contact; each contact should spring in and out.

(*b*) The plastic base that holds the 5 pin contacts is not cracked or rotated out of position.

(*c*) The studs (3 of them) that lock into the RT–841/PRC–77 AUDIO connector grooves are not missing.

b. Troubleshooting Procedure. Procedure for

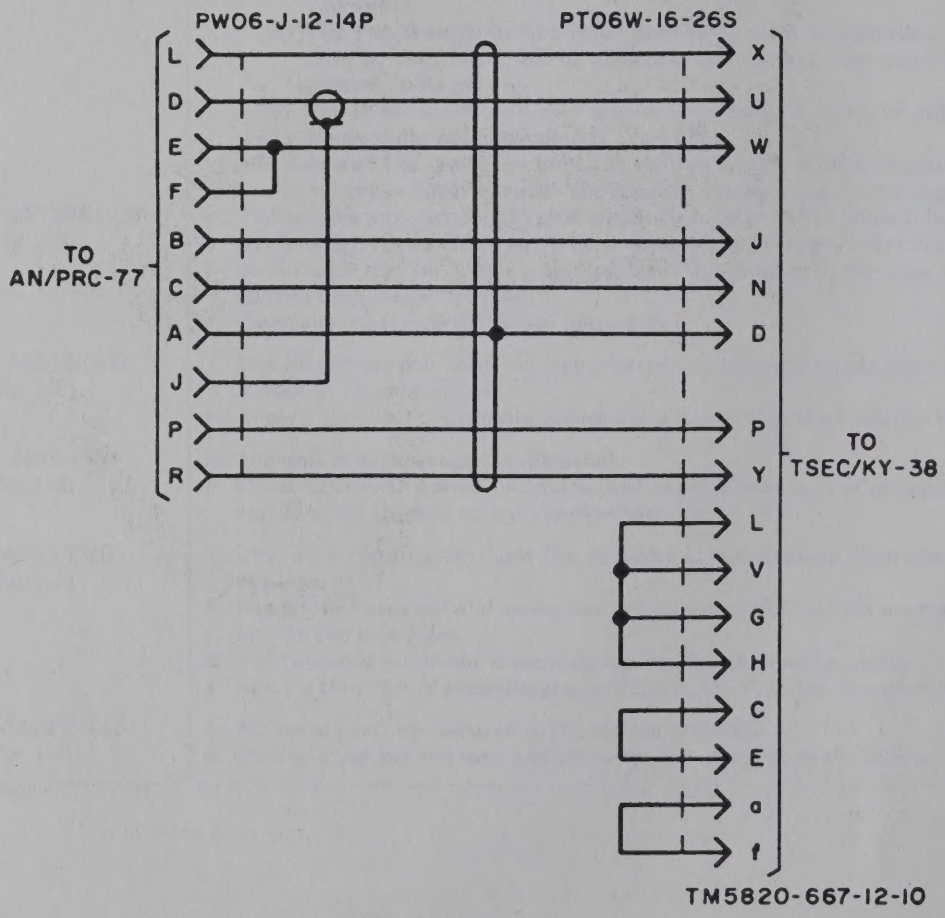
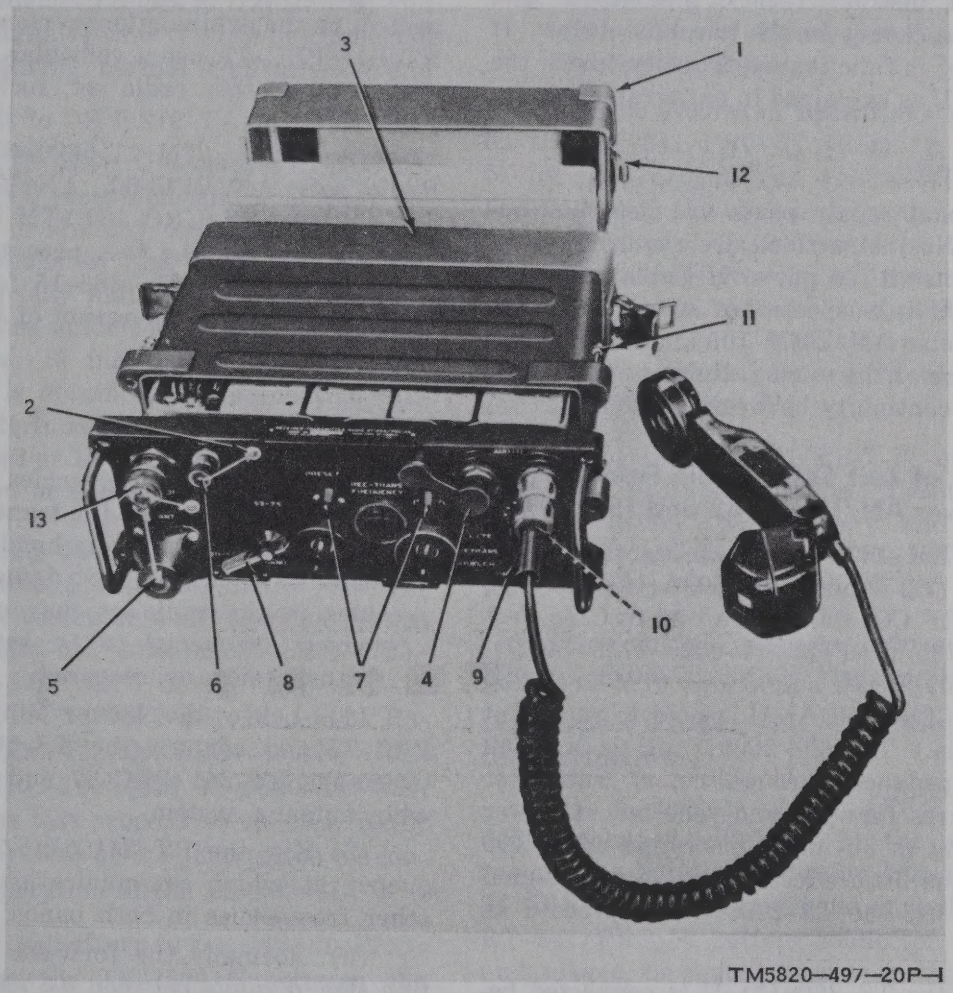


Figure 5–1. Cable Assembly CX–10475/U, schematic diagram.

checking the performance of the radio set are provided in (1), (2), and (3) below. If the corrective measures do not clear the trouble, troubleshooting is required by higher maintenance category. Report the trouble on appropriate form (TM 38–750), indicating the trouble specifically and what corrective measures were taken.

(1) Perform the procedures in paragraph 4–5 to troubleshoot the AN/PRC–77. Replace defective components (app D).



1 CY–2562/PRC–25
2 Bushing, sleeve
3 Case, receiver-transmitter
4 Cover, electrical connector
5 Cover, electrical connector
6 Cover, electrical connector
7 Dial, knob lock
8 Knob (BAND switch)
9 Knob (function switch)
10 Knob (VOLUME)
11 Screw, externally relieved body
12 Strike
13 Dummy connector, plug

Figure 5–2. Repair parts location.

(2) To check the transmitting power, use the AN/URM-182 (para 5-6). If no rf power indication is obtained, and the distant radio cannot hear the transmission using the 3-foot AT-892/PRC-25 or 10-foot AT-271A/PRC, refer the RT-841/PRC-77 to higher category maintenance for repair.

(3) If the radio set is being used with the TSEC/KY-38 (para 6-8) and the system does not operate, disconnect the CX-10475/U and perform the checks in the checklist below. If the radio set is functioning properly, check the CX-10475/U as explained in paragraph 5-5.

5-5. Repair

Organizational repair parts are listed in appendix D. No instructions are required to remove and install the parts. If Cable Assembly CX-10475/U is suspected of being defective, use Multimeter AN/URM-105 and make a continuity check of the wiring. Refer to figure 5-1 for wiring continuity between connectors.

5-6. Use of Test Sests, Radio Frequency Power AN/URM-182 and TS-2609/U

The AN/URM-182 consists of Test Set, Radio Frequency (rf) Power TS-2609A/U and Cable Assembly RF CG-409G/U stowed in Case Test Set CY-6785/U (TM 11-6625-2718-14&P). The TS-2609/U is a single unit (TM 11-6625-1686-15). (TS-2609(*)/U is used to represent both models.) The TS-2609(*)/U is a small 50-ohm impedance, throughline, rf wattmeter that measures forward and reflected rf power transmitting in 30- to 70-mc range up to 100 watts. It has little effect on received rf signal power. To use the TS-2609(*)/U, proceed as follows.

a. Since the TS-2609(*)/U is connected between the coaxial ANT receptacle and a 50-ohm antenna system or dummy load (not the whip antenna receptacle of the RT-841/PRC-77, the test would only indicate whether the RT-841/PRC-77 has sufficient or insufficient output RF power. If insufficient output power (*b*(3) below) is obtained, communication failure could be attributed to one of the following: whip antenna (3 or 10 ft); weak battery; handset; modulation or demodulation circuits.

b. Since the TS-2609(*)-U cannot be connected to the whip antenna connector of the RT-841/PRC-77, use a vehicular ship antenna system of another radio set, such as the AS-1729/VRC (or AT-912/VRC of the AN/VRC-12 series radios (TM 11-5820-401-12), or of Radio sets AN/VRC-53, AN/VRC-64, AN-GRC-125, or AN/GRC-160 (TM 11-5820-498-12). To perform the test proceed as follows. Refer to TM 11-6625-1686-15 for instruction on connections and operation of the TS-2609/U.

CAUTION

Never change frequencies or the BAND switch while the transmitter is keyed (by pressing the handset push-to-talk switch). To do so damages modules in the radio or may cause the wrong frequency to be set up for transmission or reception.

(1) Leave the battery in the RT-841 PRC-77 and connect the TS-2609(*)/U between the RT-841/PRC-77 and the vehicular whip antenna system.

(2) Key the RT-841-6RC-77 at the frequency at which communication fails and at other frequencies in both bands.

(3) Normally the forward power indication should range between 0.5 and 4 watts, depending on frequency.

5-8. Use of Test Set, Power TS-2609/U

The TS-2609/U is a small thru-line directional wattmeter which measures and monitors transmitter radiofrequency (RF) power and load match (reflected power) in 50-ohm impedance coaxial systems. It measures forward and reflected power from 0 to 100 watts and 0 to 10 watts in 30.00 to 76.00 mc range with an accuracy of 5 percent of full scale at room temperature. It provides no loss to transmitted and received RF signals; thus it may be connected to the radio during normal transmission and reception.

a. Since the TS-2609/U is connected between the coaxial ANT receptacle and a 50-ohm antenna system or dummy load (not the whip antenna receptacle of the RT-841/PRC-77), the test would only indicate whether the RT-841/PRC-77 has sufficient or insufficient output RF power. If insufficient output power (*b*(3) below) is obtained, communication failure could be attributed to one of the following: whip antenna (3 or 10 ft); weak battery; handset; modulation or demodulation circuits.

b. Since the TS-2609/U cannot be connected to the whip antenna connector of the RT-841/PRC-77, use a vehicular whip antenna system of another radio set, such as the AS-1729/VRC (or AT-912/VRC) of the AN/VRC-12 series radios (TM 11-5820-401-12), or of Radio Sets AN/VRC-53, AN/VRC-64, AN/GRC-125, or AN/GRC-160 (TM 11-5820-498-12). To perform the test proceed as follows. Refer to TM 11-6625-1686-15 for instruction on connections and operation of the TS-2609/U.

(1) Leave the battery in the RT-841/PRC-77 and connect the TS-2609/U between the RT-841/PRC-77 and the vehicular whip antenna system.

(2) Key the RT-841/PRC-77 at the frequency at which communication fails and at other frequencies in both bands.

(3) Normally the forward power indication should range between 0.5 and 4 watts, depending on frequency.

CAUTION

Never change frequencies or the BAND switch while the transmitter is keyed (by pressing the handset push-to-talk switch). To do so damages modules in the radio or may cause the wrong frequency to be set up for transmission or reception.

5-9. Inspecting RT-841/PRC-77 for Condition of Hydrogen Gas Protection Devices

Perform the following operations periodically on the RT-841/PRC-77 (item 12, para 5-5) to purge hydrogen gas (*b* below) that may accumulate in the chassis from the magnesium battery (para 1-7*a*(3)), and to inspect the items that help prevent hydrogen gas from leaking into the chassis (*c*, *d*, and *e* below). When any item in *c*, *d*, or *e* below is defective, it must be corrected before the radio is used for communication.

a. Stand the RT-841/PRC-77 on its front panel (fig. 2-2). Remove the CY-2562/PRC-25 and the battery (para 2-4*a*, *b*, and *c*). Loosen the captive screws and pull the case from the RT-841/PRC-77 chassis (fig. 5-2).

b. Blow out all parts on both sides of the RT-841/PRC-77 chassis. Use lung power.

c. Inspect RT-841/PRC-77 battery connector for the following:

(1) A rubber gasket (FSN 5330-109-6450) (shaped similarly to the metal ring around the battery connector hole in the RT-841/PRC-77 case) must be installed on the RT-841/PRC-77 battery connector. It must be undamaged, be seated flush with the bottom of the connector (and inside the four connector mounting screws), and flush with the body of the connector.

(2) The two O-rings on the battery connector must be installed and undamaged. That is, they must not be sheared, and each O-ring must be seated, under tension, in its recess.

(3) The three battery connector pins must not be bent or otherwise damaged.

d. In the RT-841/PRC-25 case (fig. 2-2), the pressure test screw must be screwed tightly, and covered with an epoxy (FSN 8040-847-6387, or equivalent) to insure that it is sealed and cannot be loosened. (The hole was used in manufacture for pressure test instruments.)

e. In the CY-2562/PRC-25 (fig. 2-2), the pressure relief valve must be installed (para 1-7*a*(3)). Check to see that it is screwed together; use a wrench to tighten the pressure relief valve nut on the inside of the CY-2562 PRC-25.

CHAPTER 6

MATERIEL USED IN CONJUNCTION WITH RADIO SET AN/PRC-77

6-1. Radio Relay Procedures and Retransmission Cable Kit MK-456/GRC

With Cable Assembly, Special Purpose, Electrical CX-4656/GRC from Retransmission Cable Kit MK-456/GRC (fig. 6-1), two compatible FM radios may be used as a radio relay for other radio sets that are too far distant to communicate directly with each other. The radio relay can be accomplished by interconnecting the radios listed in paragraph 3-10*c*(1) through (3) with the CX-4656/GRC as shown in figure 6-2.

a. MK-456/GRC. The MK-456/GRC (fig. 6-1 and 6-1.1) consists of Bag, Cotton Duck CW-502/PRC the 50-foot cable assembly CX-4656/GRC. The network box has an audio connector to which a handset or audio accessory is attached to monitor (listen to) the signals being retransmitted in both directions.

b. Selection of Frequencies.

(1) *Interference problems.* When frequencies that are to be used for retransmission are planned, the two frequencies must be at least 3 mc apart and must be selected so that the transmitter of neither radio will interfere with the receiver of the other, as shown in the retransmission interference chart (fig. 6-19).

(2) *Use of interference chart.* Each square on the retransmission interference chart (fig. 6-19) represents the intersection of two frequencies. The transmitter frequency is in mc and is plotted from left to right; the receiver frequency is in mc and is plotted from bottom to top. The black areas represent frequencies at which interference will occur; the white areas represent frequencies at which interference will not occur. There are five channels per square of the chart. Examples of use of the chart are given in (*a*) and (*b*) below.

(*a*) A transmitter frequency of 54 mc will not interfere with a receiver frequency of 32 mc.

(*b*) A transmitter frequency of 54 mc will interfere with a receiver frequency of 31 mc.

Note. Trial and error checks may disclose that frequencies other than those given in the chart (fig. 7-1) are interfering frequencies. Record these frequencies for future use.

c. Retransmission Requirements. Figure 6-2 shows the connections between an AN/PRC-77 radio set No. 2) and another radio set at the relay site. The chart in figure 6-2 shows the settings of the squelch-functioning switches required at the various sets in the radio net. In general, the relay site radios must operate with squelch signals being received from the distant radios (radio sets No. 1 and No. 4). Refer to paragraph 3-10*c*(1) through (3) and figure 3-3 for FM radios that can communicate with each other in a radio net.

d. System Lineup. Refer to figure 6-2 for the discussion in (1) through (9) below.

(1) Set up each radio at the relay site and at the distant radio sets to operate *without* squelch.

(2) Set the operating frequency of radio sets No. 1 and No. 2 on the same frequency, F1. Set the operating frequency of radio sets No. 3 and No. 4 on another frequency, F2 (*b* above).

(3) Establish communication between radio sets No. 1 and No. 2 and between radio sets No. 3 and No. 4.

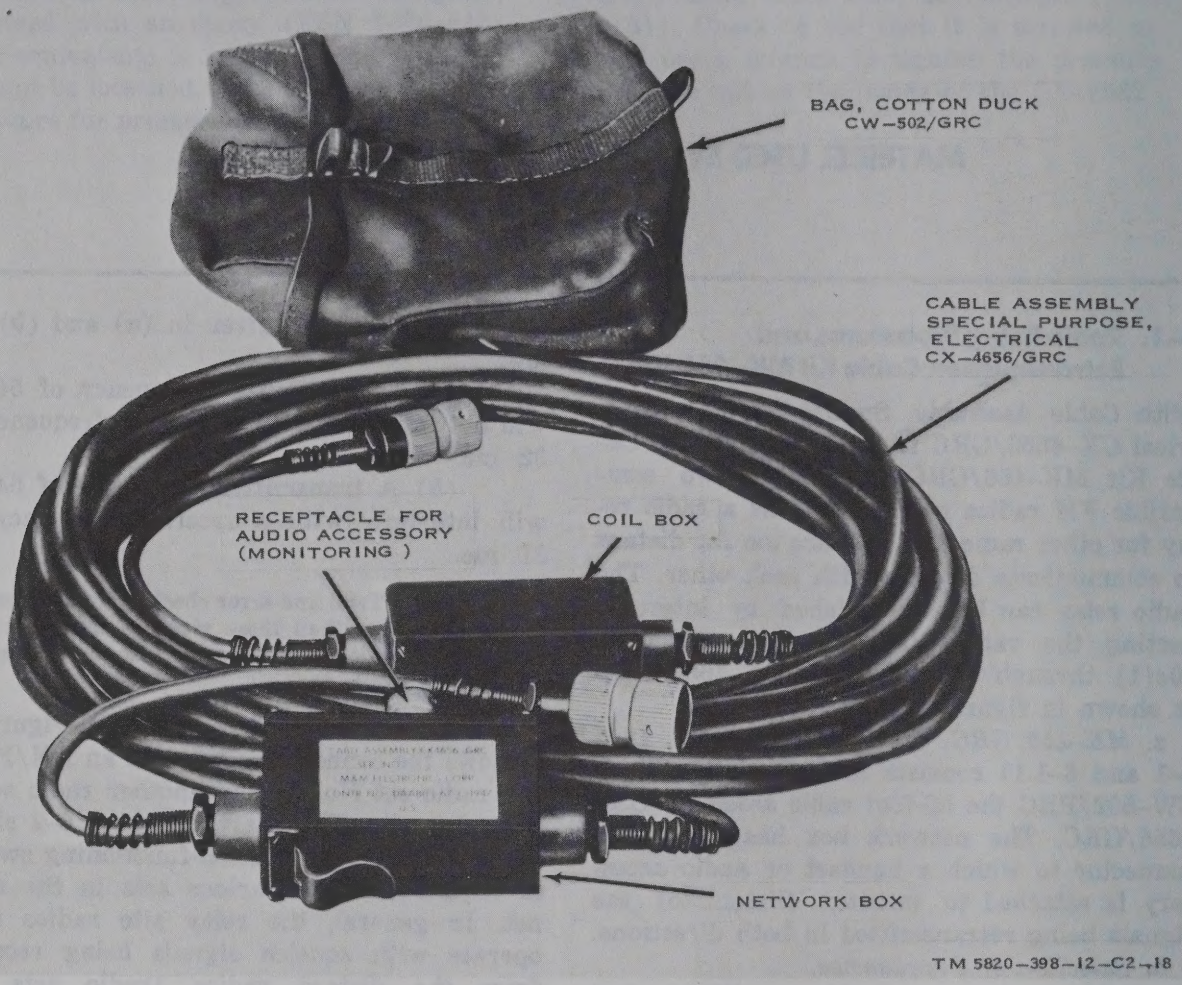


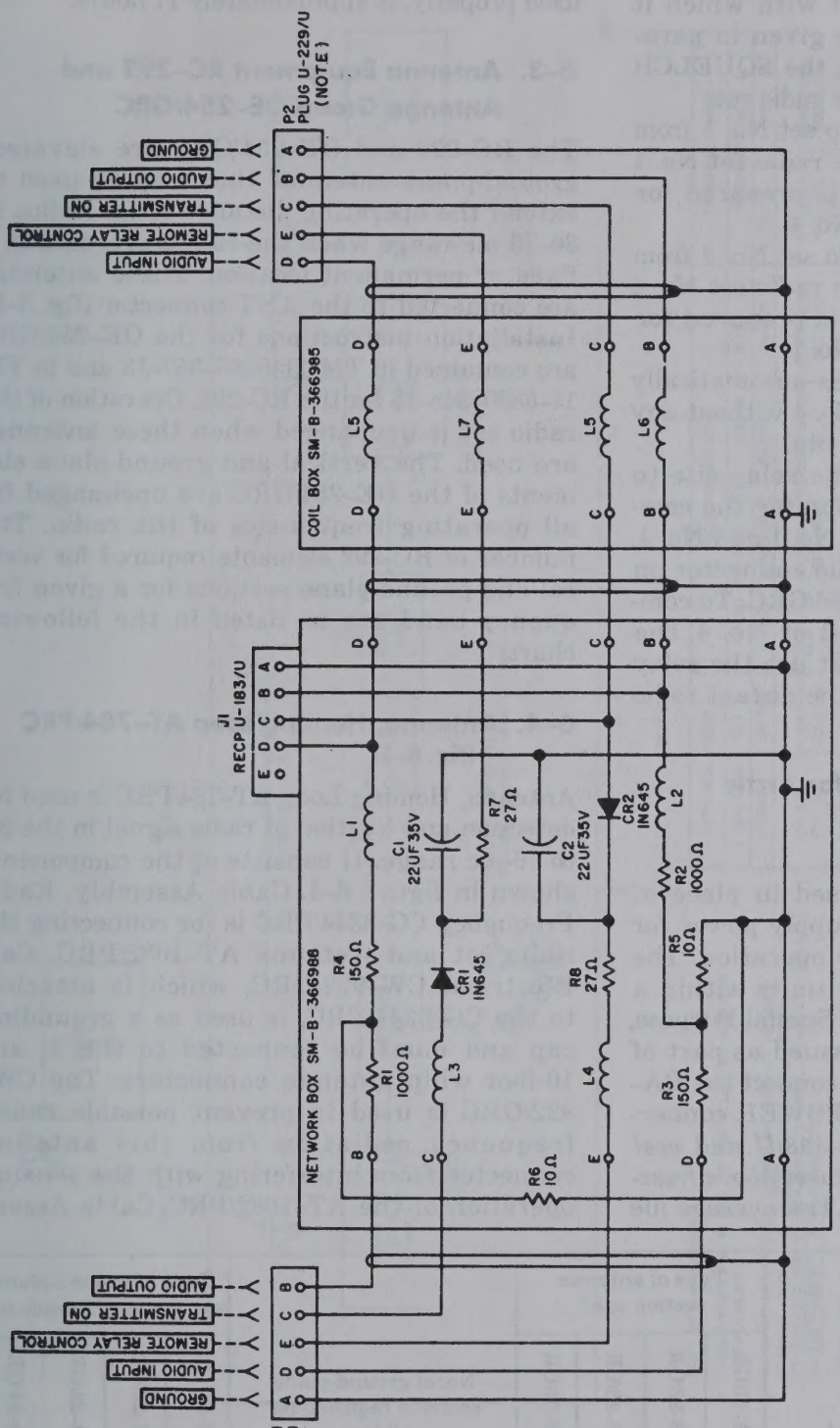
Figure 6-1. Retransmission Cable Kit MK-456/GRC.

(4) When communication is satisfactorily established between the associated radio sets, adjust each radio to operate on squelch (see chart, fig. 6-2). Check for satisfactory communication on squelch operation between the *associated pairs* of radio sets (No. 1 and No. 2; No. 3 and No. 4).

(5) When operation on squelch between the radio sets is satisfactory, advise the radio operators at radio sets No. 1 and No. 4 to standby while the following arrangements are being made:

(*a*) When the RT-841/PRC-77 at the relay site is connected in retransmission to another RT-841/PRC-77 or an RT-841/PRC-25 connect the connectors on the ends of the CX-4656/GRC to an AUDIO connector on each receiver-transmitter. On each receiver-transmitter, set the function switch to RETRANS.

(*b*) When the RT-841/PRC-77 at the relay site is connected for retransmission to the RT-246/VRC or RT-524/VRC of the AN/VRC-12 radio series, connect one end of the CX-4656/GRC to an AUDIO connector of the RT-841/PRC-77 and connect the other end of the CX-4656/GRC to the RETRANSMIT R/W connector of the RT-246/VRC or RT-524/VRC. Set the function switch of the RT-841/PRC-77 to RETRANS. Set the SQUELCH



NOTE:
PLUG U-183/U WAS USED ORIGINALLY;
IF REPLACED, USE U-229/U.

Figure 6-1.1 Cable Assembly, Special Purpose, Electrical CX-4656/GRC, schematic diagram.

switch of the RT-246/VRC or RT-524/VRC to NEW ON when the radio set with which it communicates is one of those given in paragraph 3-10*c*(1) through (3); set the SQUELCH switch to OLD ON for any other radio set.

(6) Communicate with radio set No. 1 from radio set No. 2, and advise the radio set No. 1 operator that the relay site is prepared for communication with radio set No. 4.

(7) Communicate with radio set No. 4 from radio set No. 3, and advise the radio set No. 4 operator that the relay site is prepared for communication with radio set No. 1.

(8) Communication proceeds automatically between radio sets No. 1 and No. 4 without any operation required at the relay site.

(9) For the operator at the relay site to receive instructions and to monitor the communication between radio sets No. 1 and No. 4, connect a handset to the audio connector on the network box of the CX-4656/GRC. To communicate with radio set No. 1 or No. 4, the operator at the relay site must use the relay site radio set associated with the distant radio set.

6-2. Battery, Dry BA-398/U for Arctic Operation
(fig. 6-3)

Battery, Dry BA-398/U is used in place of Battery, Dry BA-4386/U to supply power for the AN/PRC-77 during arctic operation. The BA-398/U consists of battery units within a carrying vest. Cable Assembly, Special Purpose, Electrical CX-8808/G is not issued as part of the BA-398/N; it is required to connect the BA-398/U to the RT-841/PRC-77 POWER connector. *Before operation, the BA-398/U and vest must be warmed up at temperatures above freezing for approximately 8 hours.* The average life of the BA-398/U under arctic conditions, when used properly, is approximately 17 hours.

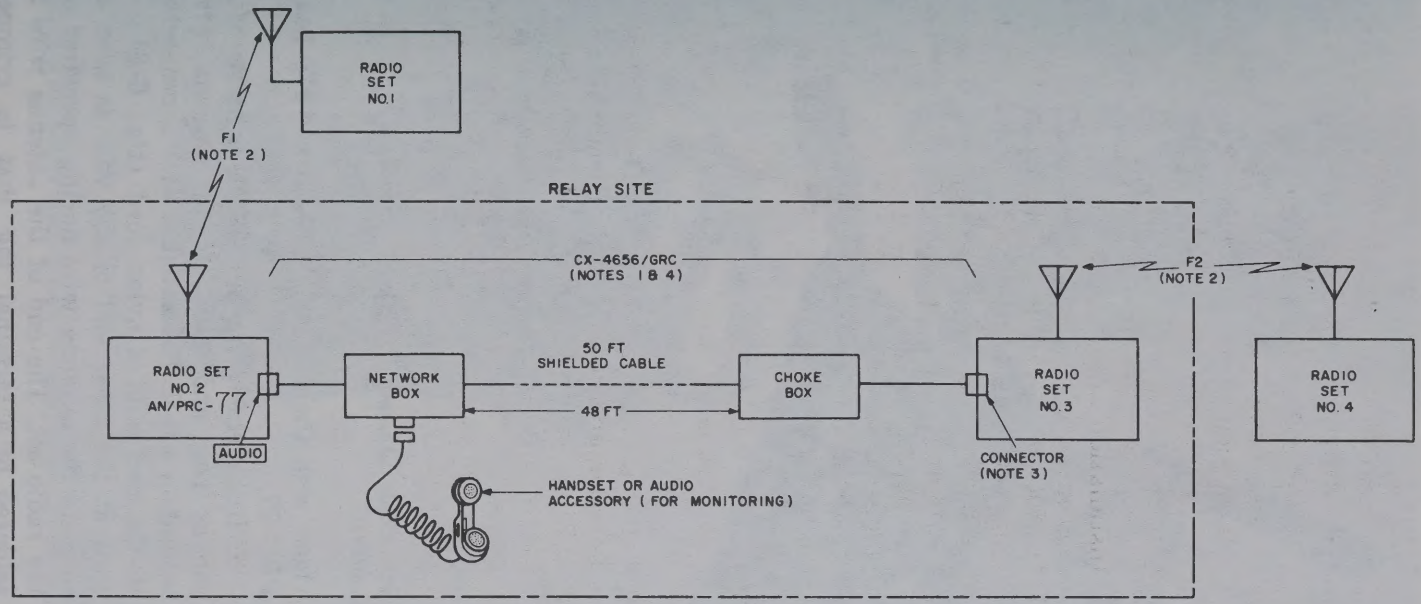
6-3. Antenna Equipment RC-292 and Antenna Group OE-254/GRC

The RC-292 and OE-254/GRC are elevated, ground-plane antennas that may be used to extend the operating distance of fm radios in 30-76 mc range when the radios are used in a fixed or permanent location. These antennas are connected to the ANT connector (fig. 3-1). Installation instructions for the OE-254/GRC are contained in TM 11-5985-357-13 and in TM 11-5820-348-15 for the RC-292. Operation of the radio set is unchanged when these antennas are used. The vertical and ground-plane elements of the OE-254/GRC are unchanged for all operating frequencies of the radio. The number of RC-292 elements required for vertical and ground-plane sections for a given frequency band are as listed in the following chart.

6-4. Antenna, Homing Loop AT-784/PRC
(fig. 6-4)

Antenna, Homing Loop AT-784/PRC is used for detection and location of radio signal in the 30- to 76-mc range. It consists of the components shown in figure 6-4. Cable Assembly, Radio Frequency CG-3344/PRC is for connecting the radio set and Antenna AT-1082/PRC. Cap, Electrical CW-922/GRC, which is attached to the CG-3344/PRC, is used as a grounding cap and must be connected to the 3- and 10-foot whip antenna connectors. The CW-922/GRC is used to prevent possible radio-frequency radiation from this antenna connector from interfering with the sensing operation of the AT-1082/PRC. Cable Assem-

Operating frequency (mc)	No. of vertical sections required	Type of antenna section used				No. of ground-plane sections required for all legs	Type of ground-plane section used in each leg			
		AB-21/GR	AB-22/GR	AB-23/GR	AB-24/GR		AB-21/GR	AB-22/GR	AB-23/GR	AB-24/GR
30 to 35.5	4	1	1	1	1	15	2	1	1	1
36.5 to 50.5	3	0	1	1	1	12	1	1	1	1
50.5 to 75.95	2	0	1	0	1	9	0	1	1	1



NOTES:

1. PART OF MK-456/GRC.
2. FREQUENCIES FOR F1 AND F2 ARE SELECTED FOR NON-INTERFERENCE.
3. WHEN RT-505/PRC-25 OR RT-841/PRC-77 IS USED, CONNECT CABLE TO [AUDIO] CONNECTOR; WHEN RT-246/VRC OR RT-524/VRC IS USED, CONNECT CABLE TO [RETRANSMIT R/W] CONNECTOR.
4. RADIO SETS NO. 2 AND NO. 3 AT RELAY SITE SEPARATED BY FULL LENGTH (50 FT) OF CX-4656/GRC.
5. [ ] INDICATES EQUIPMENT MARKING.
6. SWITCH POSITIONS REQUIRED FOR VARIOUS RADIOS IN THE RADIO RELAY NET, AS SHOWN IN TABLE.

TERMINAL RADIO		RADIO RELAY SITE				TERMINAL RADIO	
RADIO SET NO.1		RADIO SET NO.2		RADIO SET NO.3		RADIO SET NO.4	
RADIO	SWITCH	RADIO	SWITCH	RADIO	SWITCH	RADIO	SWITCH
RT-505/ PRC-25 OR RT-841/ PRC-77	FUNCTION: SQUELCH	RT-841/ PRC-77	FUNCTION: RETRANS.	RT-505/PRC-25 OR RT-841/PRC-77	FUNCTION: RETRANS	RT-505/ PRC-25 OR RT-841/ PRC-77	FUNCTION: SQUELCH
RT-246/VRC OR RT-524/VRC	SQUELCH: NEW ON, NEW OFF, OR OLD OFF			RT-246/VRC OR RT-524/VRC	SQUELCH: NEW ON	RT-246/VRC OR RT-524/VRC	SQUELCH: NEW ON, NEW OFF. OR OLD OFF
AN/ARC-54 OR AN/ARC-131	SQUELCH: TONE					AN/ARC-54 OR AN/ARC-131	SQUELCH: TONE
				RT-246/VRC OR RT-524/VRC	SQUELCH: OLD ON	COMPATIBLE FM RADIO SET OTHER THAN THOSE LISTED ABOVE.	NOT APPLICABLE

TM5820-398-12-C2-9

Figure 6-2. Radio relay connections and conditions.

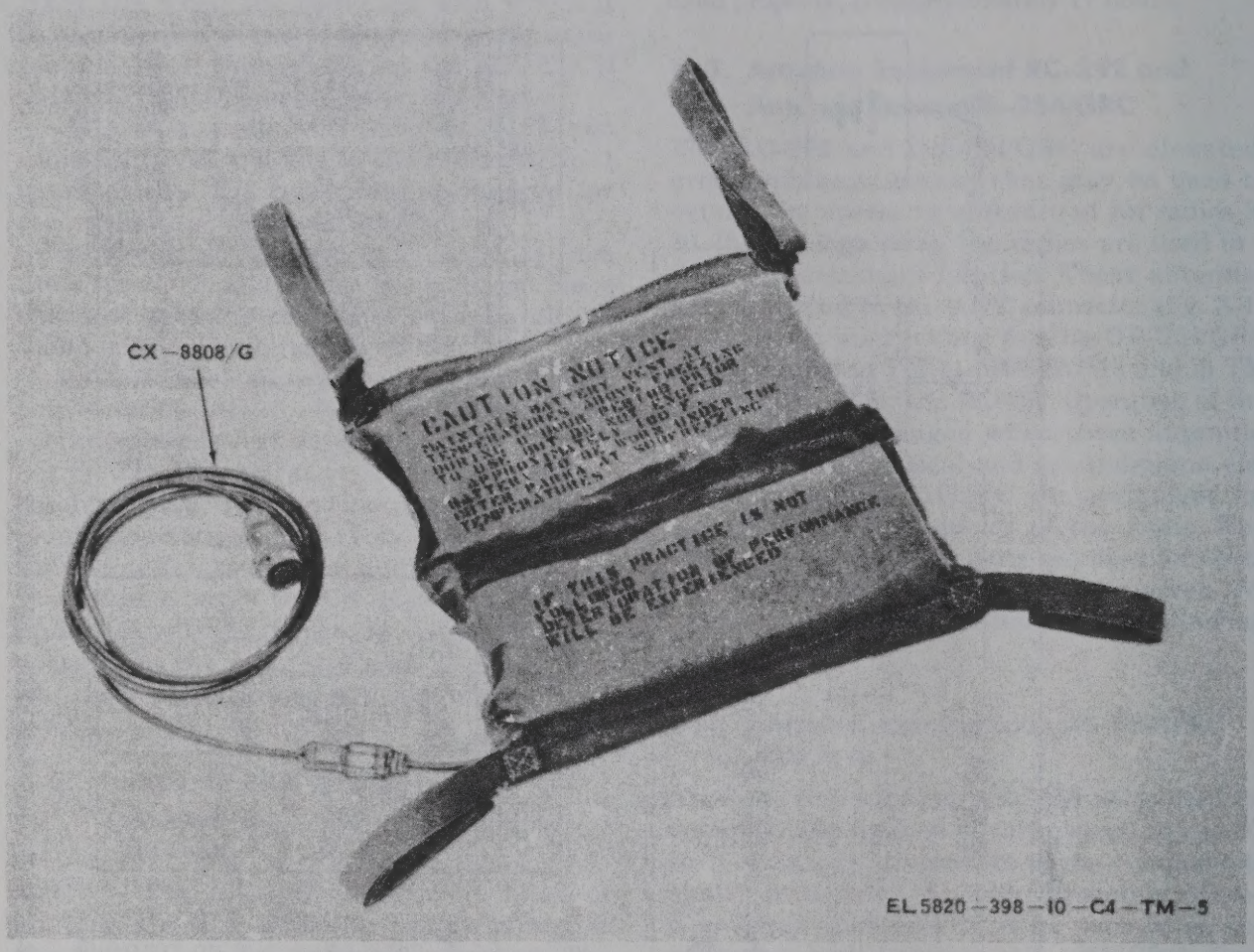


Figure 6-8. Battery, Dry BA-398/U, with Cable Assembly, Special Purpose, Electrical CX-8088/G.

bly, Radio Frequency CG-2840A/U is connected to the CG-3344/PRC to extend the distance between the radio set and the AT-1082/PRC. Refer to TM 11-5985-284-15 for operating instructions with radio sets such as the AN/PRC-77.

6-5. Antenna AT-984A/G Installation and Maintenance
(fig. 6-5)

Antenna AT-984A/G (FSN 5820-926-0201) is a long-wire, multiple wavelength antenna that is used to extend the normal transmission and reception range of radio sets that are provided with the RT-505/PRC-25 and RT-841/PRC-77.

a. Description. The AT-984/G consists of a canvas bag and 150 feet of antenna wire wound on a reel. The antenna wire is connected to the reel with a nylon cord (fig. 6-8). A cord at the other end of the wire is used to suspend the antenna wire during operation of the radio set. The end of the antenna wire is soldered to a terminal lug that is crimped around the wire and the insulating tubing to strengthen the connection. The canvas bag has two locking devices on the rear for attachment to the belt of the user while he is unwinding the antenna wire with the reel inside the bag.

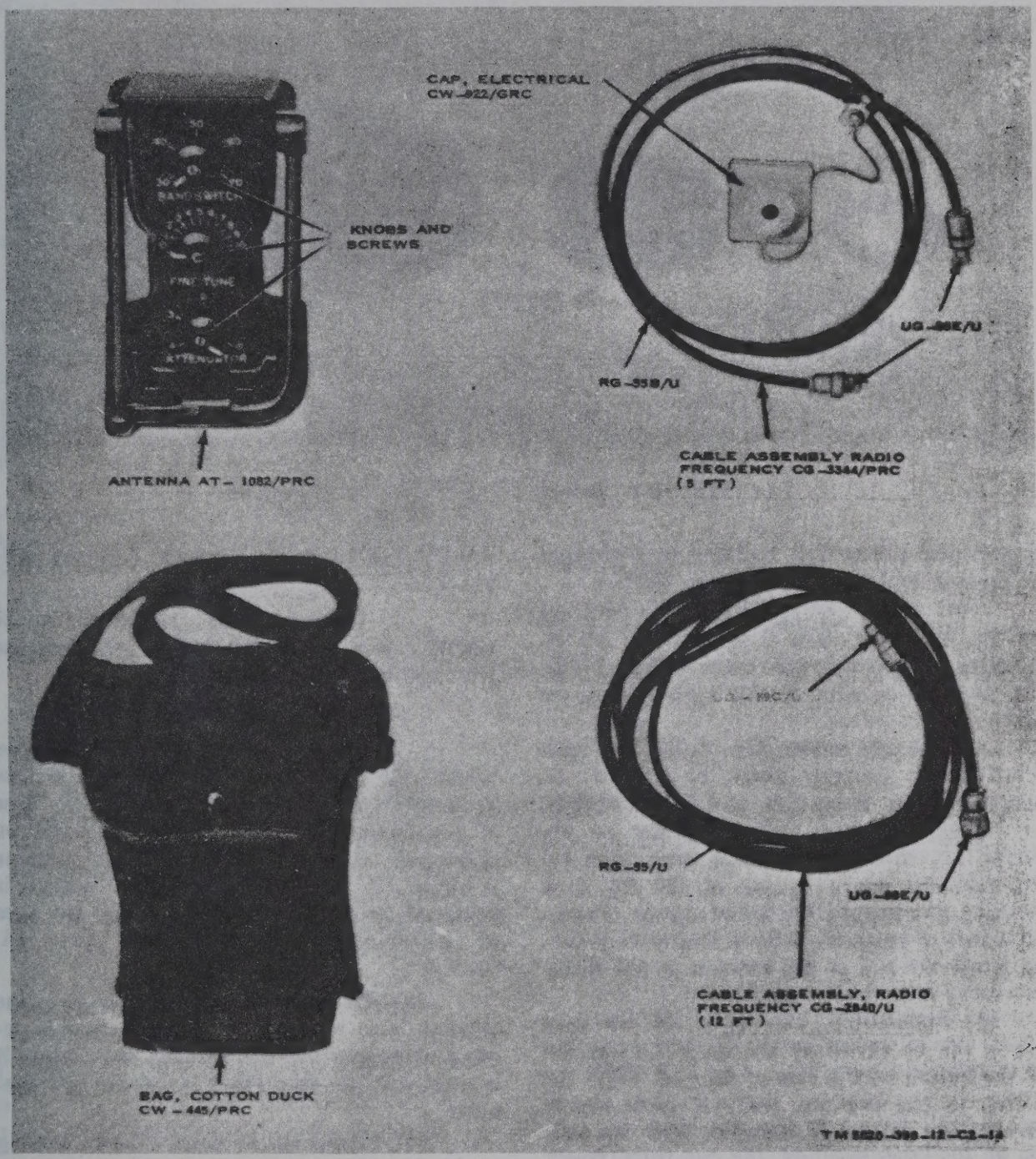


Figure 6-4. Antenna Homing Loop AT-784/PRC.

Siting and Installation.

(1) *Siting* (fig. 6-6). The operating range of the AN/PRC-77 and is primarily line of sight. That is, if the location of the other radio station can be seen, transmission and reception will probably be satisfactory. An

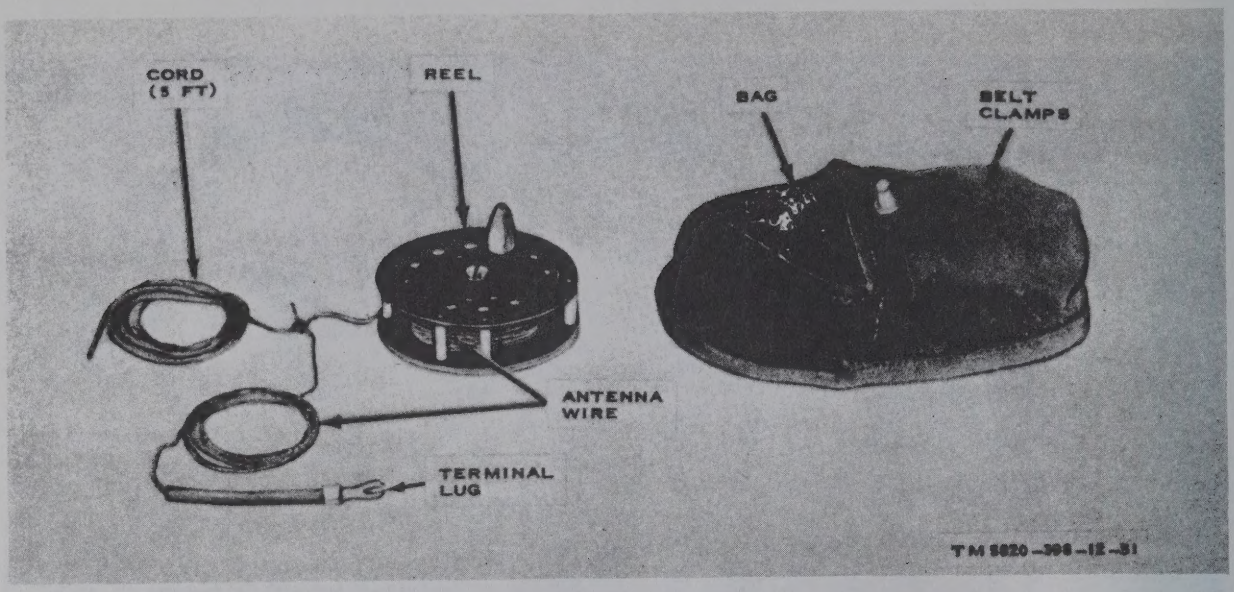


Figure 6–5. Antenna AT-984A/G, components.

intervening hill or tall building may hamper or prevent contact with the other station.

(*a*) Avoid siting the radio set in valleys, densely wooded areas, and low places. Location on a hilltop will increase the operating range if the other station's location can be seen.

(*b*) Avoid siting the radio set near interference sources such as power or telephone lines, radar sets, and field hospitals.

(*c*) Make sure that there are no obstacles preventing the antenna wire from being extended its full length of 150 feet in a straight line toward the other station. Transmission and reception with a long-wire antenna is off the end of the antenna in the direction *away* from the radio set.

(2) *Installation.* The speed of the reel action can be varied by changing the position of the button on the side of the reel. With the button in one position, the reel turns slowly because the ratchet is engaged. With the button on the other position, the reel turns freely because the ratchet is not engaged.

(*a*) Connect the terminal lug at the end of the antenna wire to the radio set as given in *1* through *3* below. Figure 6–7 shows the connection to the RT-841/PRC-77.

1. Remove the long whip antenna AT–271A/PRC from Support, Antenna AB–591/PRC–25.

2. Unscrew the AB–591/PRC–25 slightly, and insert the lug of the antenna wire under it.

3. Tighten the AB–591/PRC–25.

4. When the antenna is aimed toward the other radio station that is also equipped with a long-wire antenna, the area of communication covers 18° of azimuth on either side of the line along which the antenna is aimed (B, fig. 6–6). If the other station is equipped only with a whip antenna, the area of communication covers only 15° (A, fig. 6–6).

(*b*) Tie the cord that is attached to the antenna wire to a nearby support that is capable of supporting the antenna wire when it is stretched to the other support 150 feet away.

(*c*) Unreel the antenna wire by moving in the direction of the other radio station.

Note. The reel can be placed in the canvas bag which then can be attached to the user's trouser belt. In this way, the antenna wire can be unreeled without handling the reel.

(*d*) Stretch the antenna wire approximately 4 feet above the ground by securing

the reel to a building, tree, post, or similar support. Use the cord that ties the antenna wire to the reel (fig. 6–8).

WARNING

If the tactical situation permits, use warning signs or similar safety measures to prevent personnel and vehicles from running into the stretched antenna wire.

c. Maintenance. There are no maintenance parts for the AT–984A/G.

(1) If the terminal lug is broken, damaged, or lost, cut off the rubber tubing immediately behind the terminal lug (fig. 6–8), and cut back the tubing to expose 1/4 inch of antenna wire. Obtain a new terminal lug; crimp the terminal lug around the tubing the same way as the old terminal lug was crimped. Solder the 1/4 inch of projecting antenna wire to the terminal lug.

(2) If it is necessary to replace either of the two lengths of cord, obtain a 5-foot length of non-conductive, 100-pound test, olive-drab cord. To prevent the nylon cord from unraveling, put the end above a flame momentarily.

WARNING

The fumes of TRICHLOROETHANE are toxic. Provide thorough ventilation whenever it is used; avoid prolonged or repeated breathing of vapor. Do not use near an open flame or hot surface; trichloroethane is nonflammable but heat converts the fumes to a highly toxic phosgene gas, the inhalation of which chould result in serious injury or DEATH. Prolonged or repeated skin contact with trichloroethane can cause skin inflammation. When necessary, use gloves, sleeves and aprons which the solvent cannot penetrate.

d. Cleaning. Unreel the antenna wire and clean it with a clean cloth. Trichloroethane may be used to facilitate dirt and grease removal.

6–6. Loudspeaker, Electromagnetic LS–549/PRC

This item is no longer available.

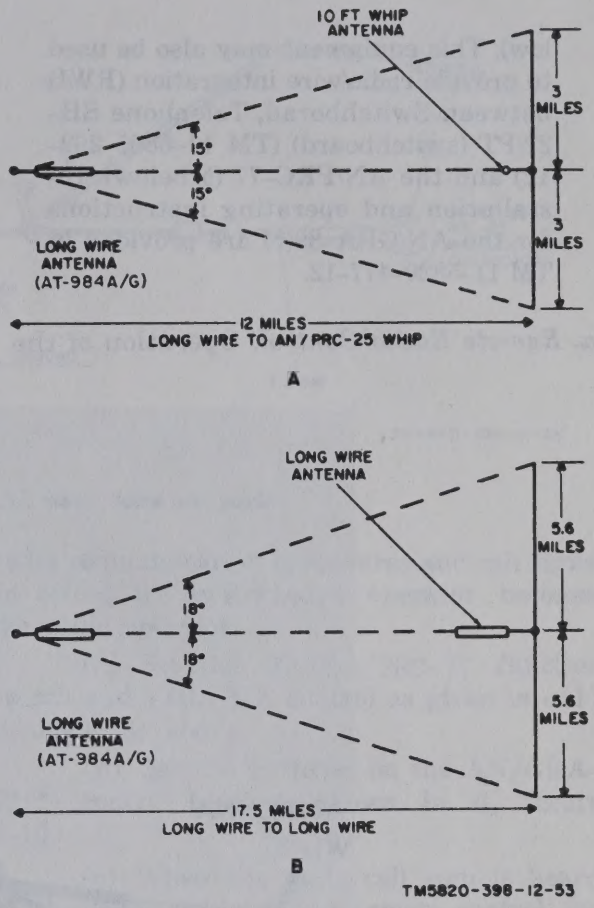


Figure 6–6. AT–984A/G, radiation patterns and siting diagram.

6–7. Radio Set Control Group AN/GRA–39(*)

NOTE

Radio Set Control Group AN/GRA–39(*) presents all models of the equipment; Control, Radio Set C–2328(*)/GRA–39 represents all models of the equipment; Control, Radio Set C–2329(*)/GRA–39 represents all models of the equipment.

The AN/GRA–39(*) may be used to provide remote radio control of radio transmission and reception of the AN/PRC–77 up to approximately 2 miles (3.3 kilometers, approximately) (*a* be-

low). This equipment may also be used to provide radio/wire integration (RWI) between Switchborad, Telephone SB-22/PT (switchboard) (TM 11-5805-262-12) and the AN/PRC-77 (*b* below). Installation and operating instructions for the AN/GRA-39(*) are provided in TM 11-5820-477-12.

a. Remote Radio Control. Operation of the AN/PRC-77 as described in paragraphs 3-2 through 3-8 is unchanged except as follows:

(1) When the AN/GRA-39 or AN/GRA-39A is used and its local control, the C-2329/GRA-39 or C-2329/GRA-39, has not been modified by the application of rescinded MWO 11-5820-477-30/1 to permit use of the function switch on the RT-841/PRC-77 in the SQUELCH position, the radio communication must be conducted with the function switch

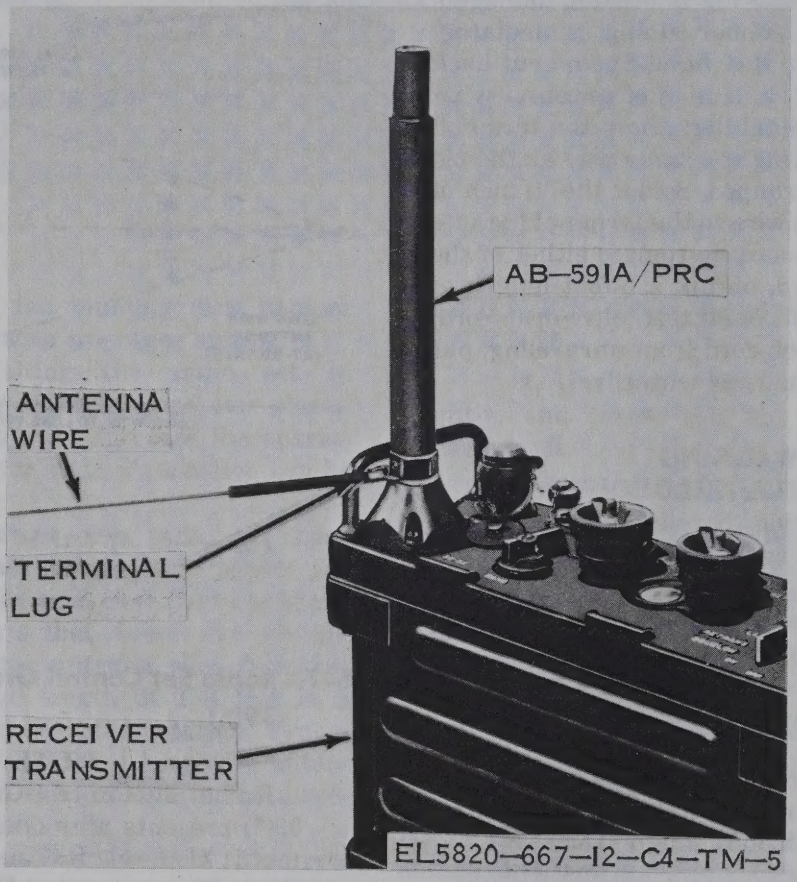


Figure 6-7. Connection of antenna wire of AT-984A/G to RT-841/PRC-77.

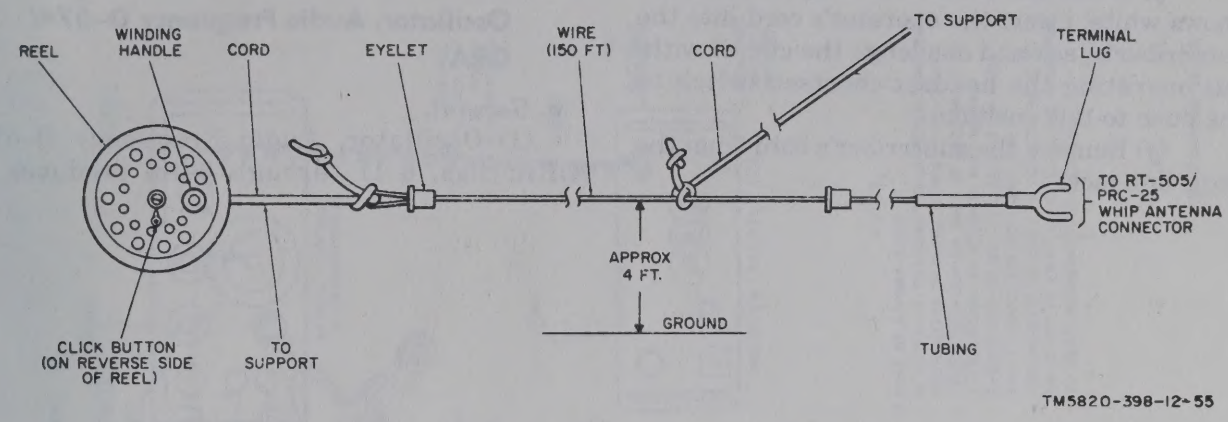


Figure 6–8. Antenna AT–984A/G, installation and parts.

set to ON only. In turn, the distant radio set in the net must also operate without squelch operation (para 3–10*c*(1) through (3)).

(2) When the AN/GRA–39B (in which the C–2329B/GRA–39 local control box is used) or when the local control box of the AN/GRA–39 or AN/GRA–39A ((1) above) have been modified, the function switch of the RT-841/PRC-77 may be set to SQUELCH.

(3) If the radio reception is cutting in and out (caused by receiver-to-transmitter feedback loop that causes the relay in RT-841/PRC-77 to alternate between receive and transmit positions), set the VOLUME control on the RT–505/PRC–25 down to a position at which interruption of the signal ceases.

b. Radio/Wire Integration (RWI). To provide RWI between the AN/PRC-77 and an SB–22/PT, using the AN/GRA–39(*), proceed as follows:

(1) *Connections.*

(*a*) Prepare a Connector, Plug U–182/U (FSN 5935–823–0663; part of H–138(*)/U) or U–229/U (FSN 5935–173–8537; part of H–189/GR) with two jumper wires soldered to pins A and C (keying circuit).

(*b*) Position the C–2328(*)/GRA–39 remote control at the SB–22/PT, and connect the equipment as shown in A, figure 6–10.

(2) *Operation.* Since the remote control is set up at the switchboard, the switchboard operator will respond to calls from the distant radio station with the push-to-talk radio position of his headset-chestset and will use correct radio communication procedures and call signs. In effect, the switchboard operator becomes the radio operator.

(*a*) Set the RT-841/PRC-77 function switch and VOLUME control as given in *a*(1) through (3) above.

(*b*) Set the switches on the AN/GRA–39(*) control boxes as shown in A, figure 6–10.

(*c*) When the radio call sign is heard on the loudspeaker of the remote control, insert the operator's cord into the radio link jack and determine the desired subscriber. Advise the distant radio station to stand by while making the arrangements in *1* and *2* below (B, fig. 6–10).

1. Connect the operator's cord to the subscriber's jack, ring, and notify the subscriber of the radio call. Advise the subscriber of the call signs, and tell him to ring back when the call is completed.

2. Connect the subscriber's cord to the radio link jack.

Note. Operation of the switchboard headset-chestset switch to the push-to-talk *radio* position while the operator's cord is connected to the subscriber's jack will key the radio.

(*d*) Remove the operator's cord from the subscriber's jack.

(*e*) The incoming radio communication can be heard on the remote control loudspeaker; the subscriber's voice cannot be heard.

(*f*) When the subscriber's signal indicator shows white, insert the operator's cord into the subscriber's jack and challenge the circuit without operating the headset-chestset switch to the push-to-talk position.

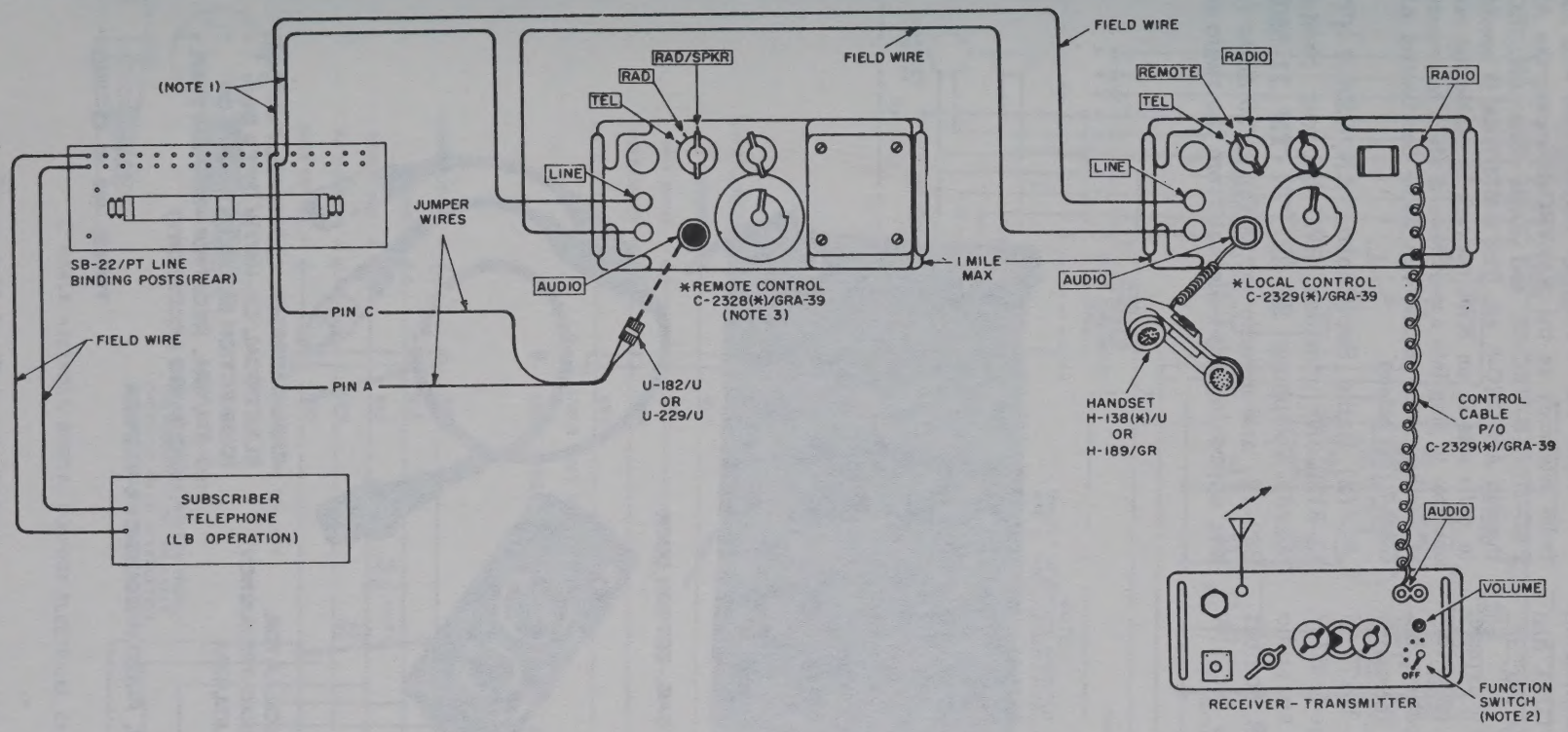
(*g*) Remove the subscriber's cord from the radio link jack.

6-8. Radio Set Control AN/GSA-7 and Oscillator, Audio Frequency O-574/GRA

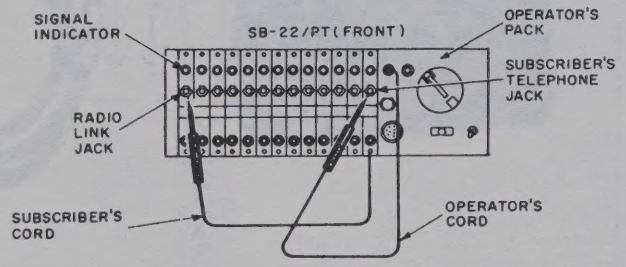
a. General.

(1) Oscillator, Audio Frequency O-574 /GRA (figs. 6-11 through 6-13) produces a

Figure 6-9. Deleted.



A. INTERCONNECTIONS AND SWITCH POSITIONS.



B. SWITCHBOARD CONNECTIONS FOR SUBSCRIBER-RADIO LINK.

NOTES:

* PART OF AN/GRA-39(*).

1. IF RECEIVER-TRANSMITTER IS KEYED, TRANSPOSE CONNECTION OF THESE WIRES AT SB-22/PT.
2. SQUELCH POSITION MAY BE USED WHEN C-2329B/GRA-39 IS USED, AND WHEN C-2329/GRA-39 OR C-2329A/GRA-39 HAS MWO 11-5820-477-30/1 APPLIED.
3. THE REMOTE CONTROL IS LOCATED NEXT TO SB-22/PT TO ENABLE SWITCHBOARD OPERATOR TO HEAR INCOMING RADIO CALLS.

TM5820-398-12-C2-11

Figure 6-10. AN/GRA-39(*) in RWI with AN/PRC-77.

1,600-cps ringing signal for transmission through a radio system. The O-574/GRA has two cable assemblies: Cable assembly (SC-C-75348) and Cable Assembly, Special Purpose, Electrical CX-10177/U. The cable assembly (SC-C-75348) is provided for connection between the O-574/GRA and an audio accessory such as Handset H-33/PT; the CX-10177/U is provided for connection between the O-574/GRA and the RT-841/PRC-77 and an audio accessory, such as Handset H-189/GR, combat vehicle crewman (CVC) helmet, etc.

Note. The O-574/GRA may be used with other radio sets such as the AN/VRC-12-series; the AN/PRC-77, AN/VRC-53, and Radio Sets AN/GRC-8 through AN/GRC-8, etc. The O-574/GRA is provided to radio sets in an RWI network to enable the radio operator to ring into a switchboard which is connected to another radio set through Radio Set Control AN/GSA-7 ((2) below).

(2) Radio Set Control AN/GSA-7 (TM 11-5135-15) provides RWI between Switchboard, Telephone SB-22/PT (TM 11-5805-262-12) and a radio set as far as 10 miles (16 km, approximately) distant from the radio set.

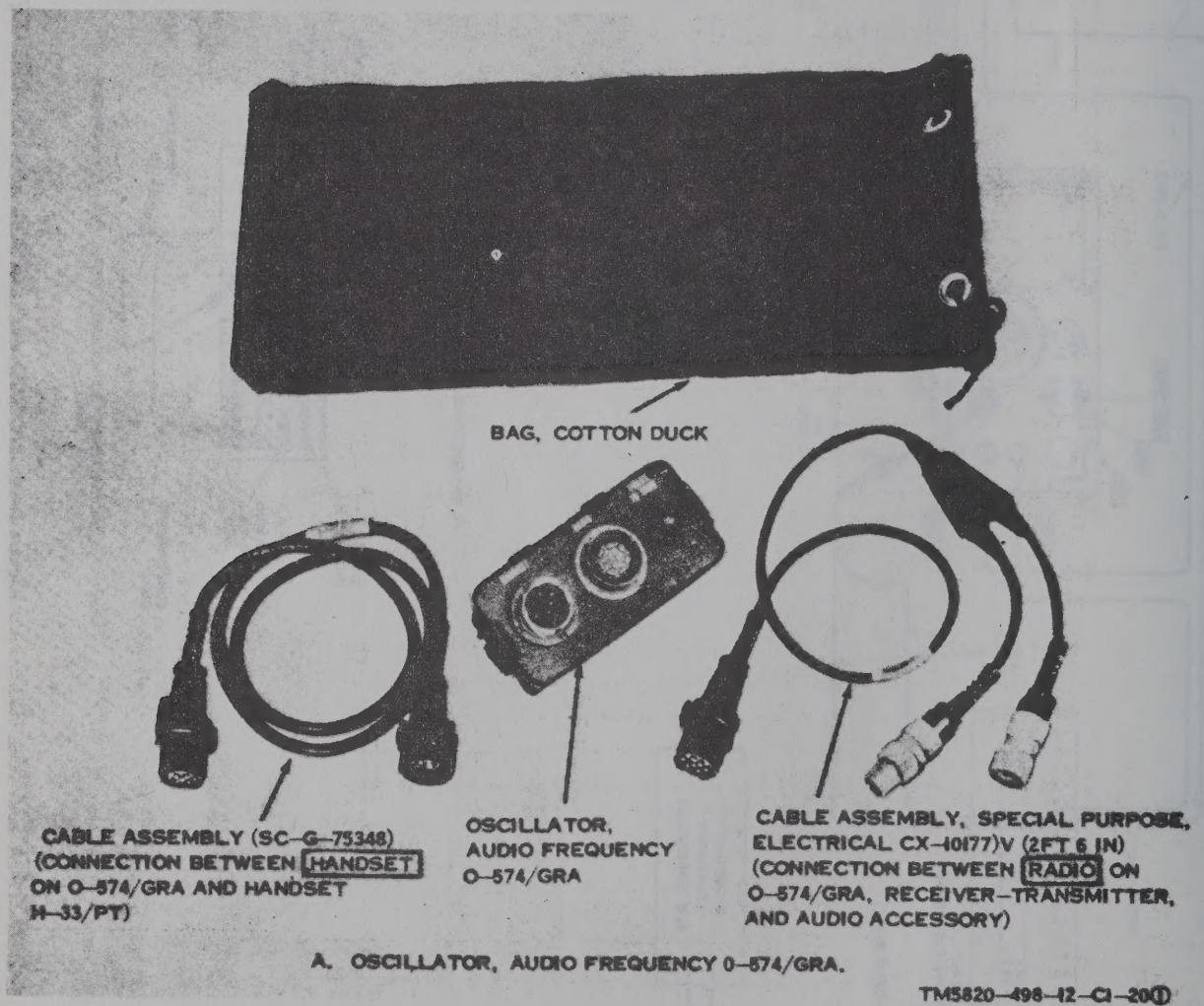
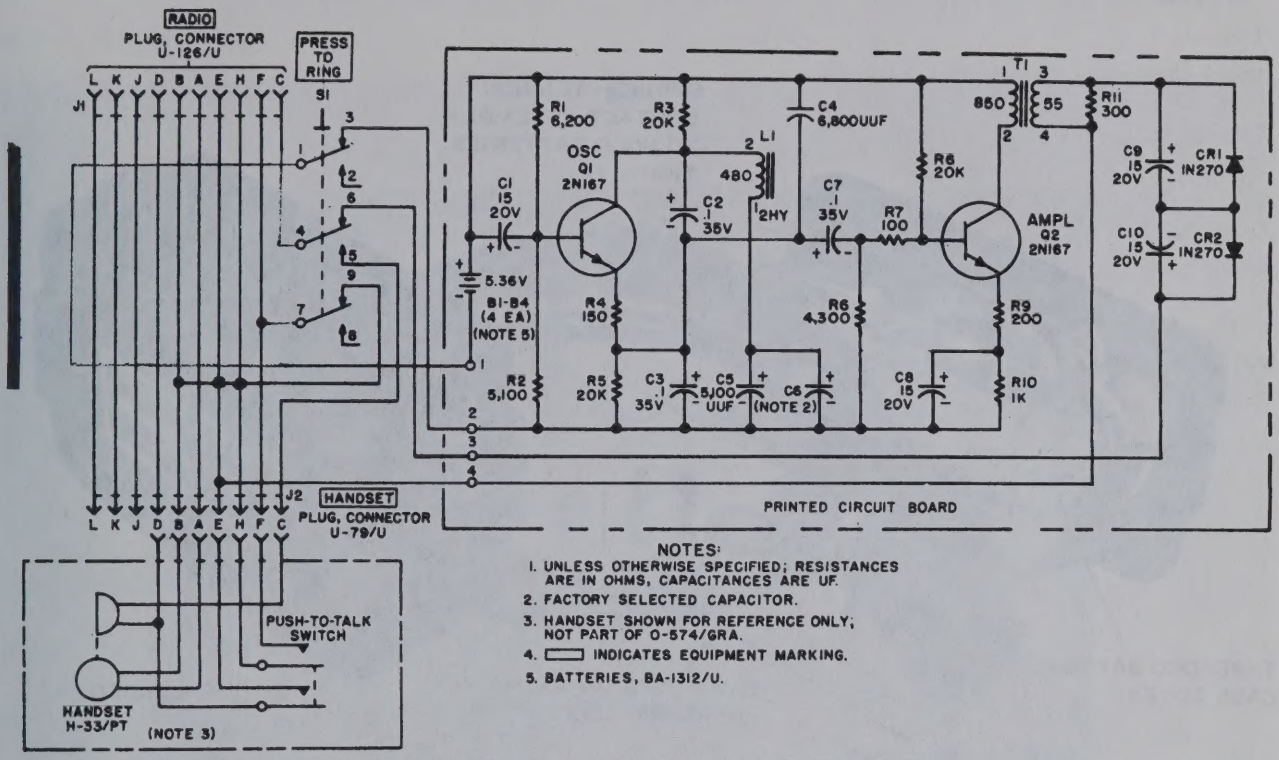
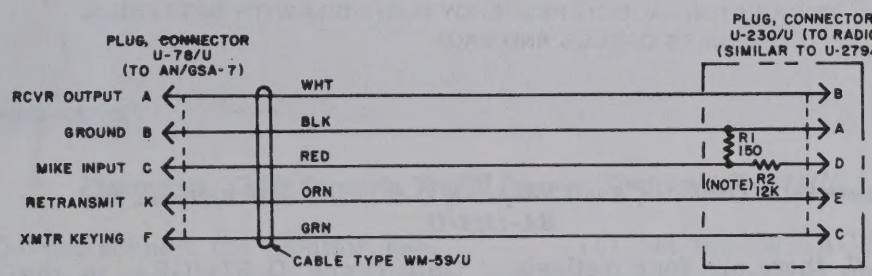


Figure 6-11. Oscillator, Audio Frequency O-574/GRA.



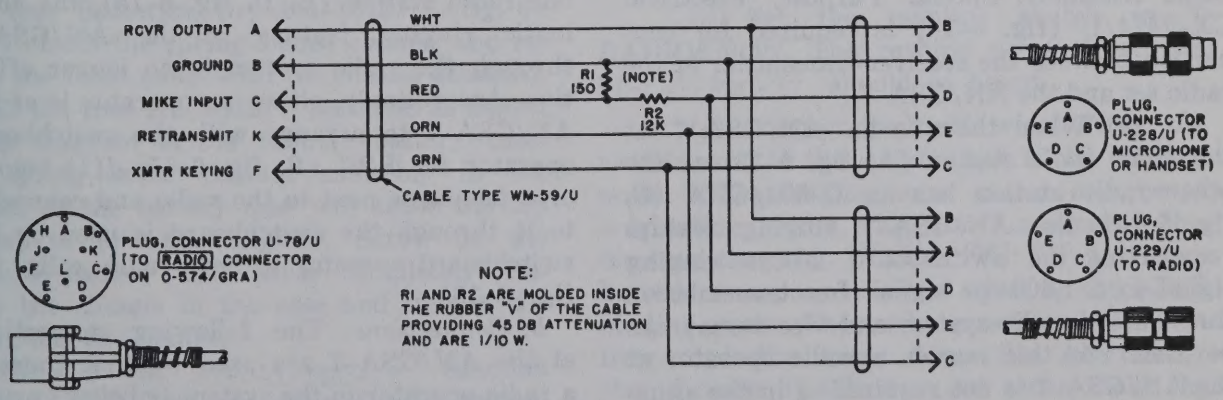
NOTES:
1. UNLESS OTHERWISE SPECIFIED; RESISTANCES ARE IN OHMS, CAPACITANCES ARE UF.
2. FACTORY SELECTED CAPACITOR.
3. HANDSET SHOWN FOR REFERENCE ONLY; NOT PART OF O-574/GRA.
4. ▭ INDICATES EQUIPMENT MARKING.
5. BATTERIES, BA-1312/U.

A. OSCILLATOR, AUDIO O-574/GRA WITH HANDSET H-33/PT.



NOTE:
R1 AND R2 ARE MOLDED IN CONNECTOR PROVIDING 45 DB ATTENUATION AND ARE 1/10 W.

B. CABLE ASSEMBLY, SPECIAL PURPOSE, ELECTRICAL CX-7474/U.



C. CABLE ASSEMBLY, SPECIAL PURPOSE ELECTRICAL CX-10177/U (2 FT., 6 IN.).

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Figure 6-12. Oscillator, Audio Frequency O-574/GRA and cable assemblies, Special Purpose, Electrical CX-7474/U and CX-10177/U, schematic diagrams.

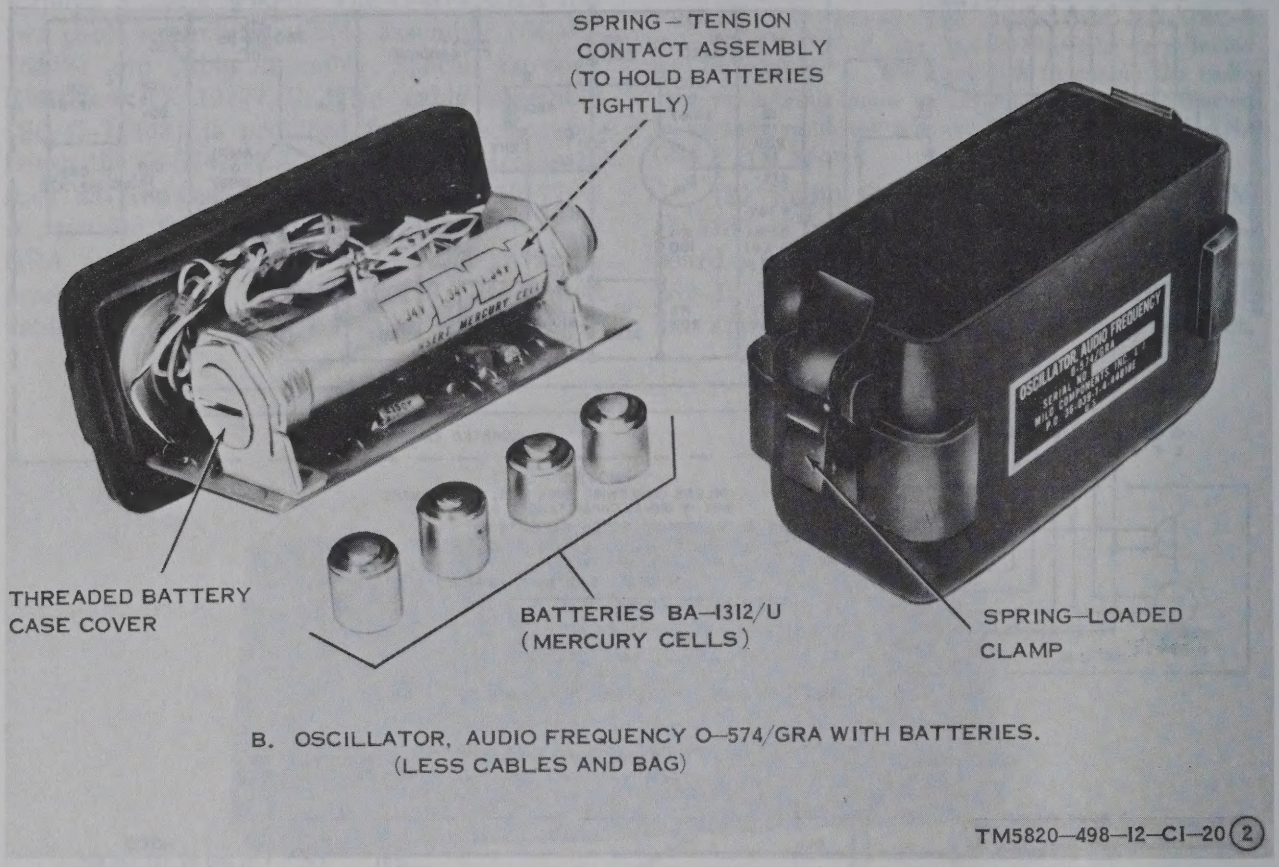


Figure 6-13. Oscillator, Audio Frequency O-574/GRA with Batteries, Dry BA-1312/U.

With the AN/GSA-7, there are four methods of providing RWI, depending on the number of AN/GSA-7's in the system (fig. 6-15). Cable Assembly, Special Purpose, Electrical CX-7474/U (fig. 6-14) is required for connection between the receiver-transmitter of the radio set and the AN/GSA-7.

(*a*) When there is an AN/GSA-7 at the other radio station (A, fig. 6-15) or the other radio station has an O-574/GRA (C, fig. 6-15), the AN/GSA-7 ringing feature (converting the switchboard 20-cps ringing signal to a 1,600-cps signal for transmission through the radio system and vice versa) can be used. For this reason, a radio operator at the AN/GSA-7 is not required as in the situations in (*b*) below. The operating procedures for two AN/GSA-7's in the system are given in *c* below. The operating procedures for AN/GSA-7 and O-574/GRA in the system are given in *d* below.

(*b*) When there is no AN/GSA-7 at one radio station (B, D, fig. 6-15), the automatic ringing feature in the AN/GSA-7 through the radio system is no longer effective. Accordlingly, either an operator is at the AN/GSA-7 to arrange with the switchboard operator for RWI (B, fig. 6-15; *d*(1) below) or a telephone next to the radio and connected to it through the switchboard is used by the switchboard operator to hear radio calls (D, fig. 6-15).

b. Connections. The following connections at the AN/GSA-7 are used whether there is a radio operator in the system (*c* below) or not (*d* below).

(1) Interconnect the AN/GSA-7 and RT-841/PRC-77 with the CX-7474/U (A,

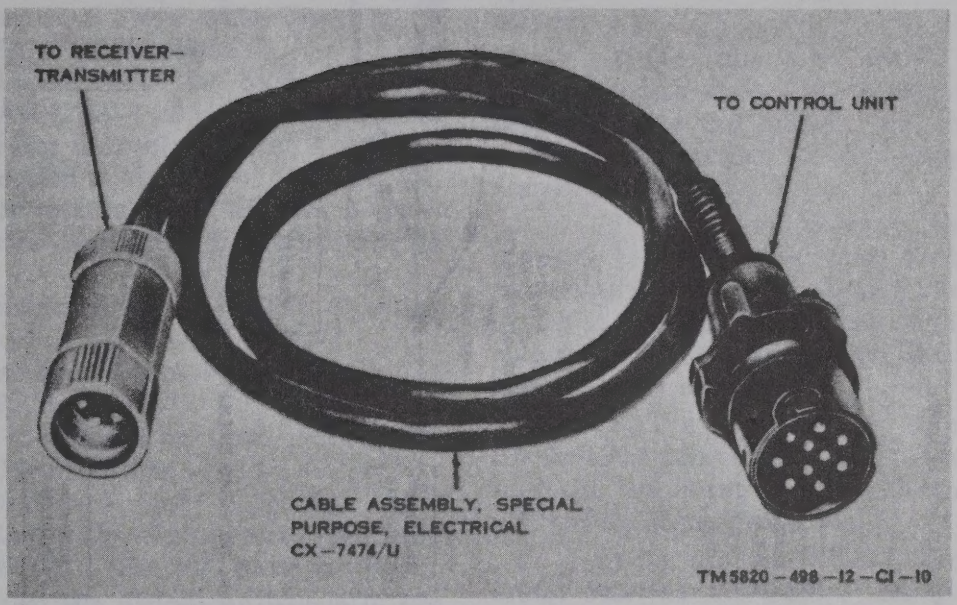


Figure 6-14. Cable Assembly, Special Purpose, Electrical CX-7474/U.

fig. 6-16). Do not connect the monitor telephone unless there is no radio operator at the AN/GSA-7 (*d*(2) below).

(2) Before using the O-574/GRA, install four Batteries, Dry BA-1312/U (fig. 6-13). Unlatch the spring-loaded clamps, and remove the front panel with the chassis attached. Install the four BA-1312/U batteries as shown in the diagram on the tubular battery case. The spring-loaded contact assembly in the bottom of the battery case will cause the top battery to protrude slightly. Screw on the threaded battery case cover completely. Replace the chassis in the case and tighten the spring-loaded clamps.

(3) Set the RT-841/PRC-77 function switch to ON. Tune in a desired radio station.

(4) Make the following adjustments on the AN/GSA-7:

(*a*) Connect the AN/GSA-7 to a power source (TM 11-5135-15).

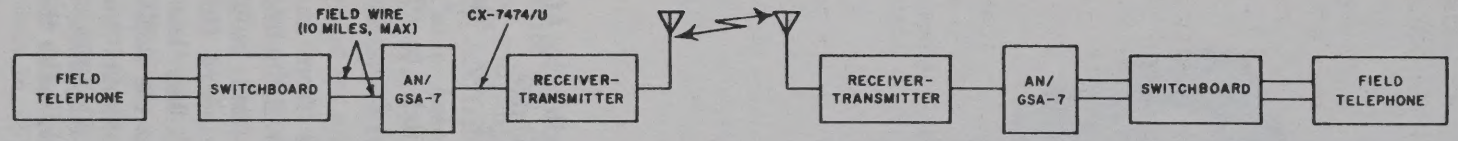
(*b*) Set the OFF-AC-DC switch to AC or DC, depending on the power source.

(*c*) Connect the H-33/PT to the AUDIO connector.

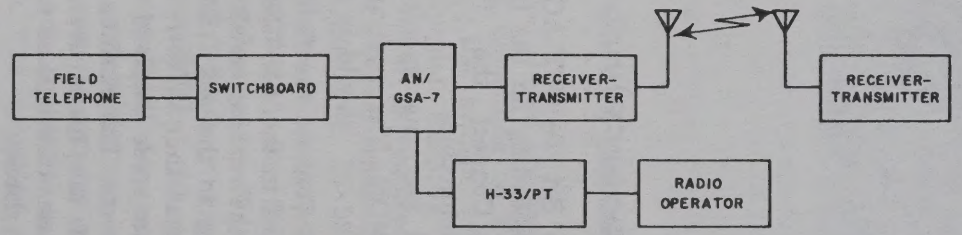
(*d*) Set the monitor switch to T RADIO&MON. The rushing noise from the RT-841/PRC-77 should be heard.

(*e*) Connect the field wires from the switchboard to the AN/GSA-7 LINE binding posts. If the rushing noise ceases and beeps originating in the AN/GSA-7 are heard (indicating that the RT-841/PRC-77 has been keyed), transpose the field wires at the LINE binding posts. The rushing noise should return, and the beeps from the AN/GSA-7 should cease. If this does not occur, make the following checks:

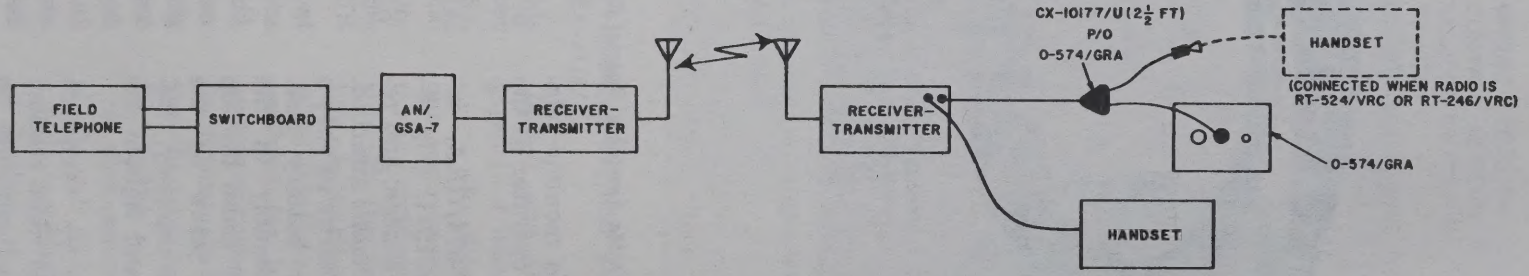
1. Check to see that no switchboard cord is connected to the radio link jack (B, C, fig. 6-16).



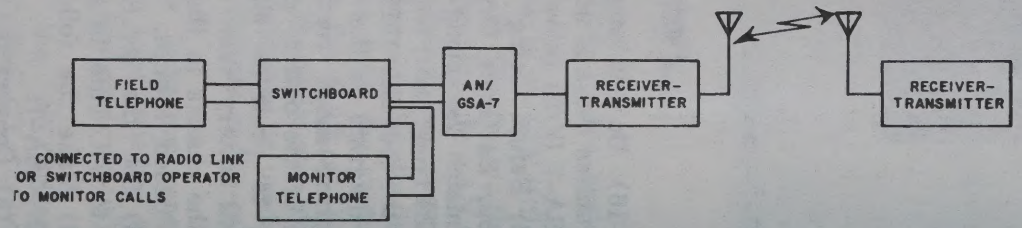
A. AN/GSA-7 AT BOTH STATIONS; RADIO OPERATOR NOT REQUIRED.



B. AN/GSA-7 AT ONE STATION; RADIO OPERATOR REQUIRED.



C. AN/GSA-7 AT ONE STATION, O-574/GRA AT OTHER; NO RADIO OPERATOR REQUIRED.



D. AN/GSA-7 AT ONE STATION, RADIO MONITOR TELEPHONE; NO RADIO OPERATOR REQUIRED.

TM5820-398-12-C2-16

Figure 6-15. Arrangements for RWI with RT-841/PRC-77 and Radio Set Control AN/GSA-7.

2. Check to see that the field wires are not short-circuited.

(*f*) Proceed to check the operation of the radio with the H-33/PT.

(*g*) Use the procedures in *c* below when there are two AN/GSA-7's in the system, and those in *d* below when there is no other AN/GSA-7 in the system.

c. Two AN/GSA-7's in System. When there is an AN/GSA-7 at each radio station, no radio operator is required at the AN/GSA-7 that is connected to the RT-841/PRC-77 (A, fig. 6-15). Normal ringing between switchboard operators over the radio system can be used.

(1) Interconnect the AN/GSA-7 equipment (*b* above).

(2) At each AN/GSA-7, set the monitor switch to T RADIO&MON.

(3) Set the switch on each subscriber's telephone to LB operation.

(4) Switchboard and subscriber telephone operation may now proceed normally for radio operation. Use the hand generator (20 cps) to call the distant switchboard; use push-to-talk radio operation with the proper radio call signs and radio procedures.

d. One AN/GSA-7 in System. When there is no AN/GSA-7 at the other radio station, there are three methods of providing RWI. In one arrangement ((1) below), a radio operator is stationed at the AN/GSA-7, to make the RWI arrangements with the switchboard operator (B, fig. 6-15). In a second arrangement ((2) below), a telephone at the switchboard is continuously connected to the radio system; the switchboard operator answers radio calls on this telephone and makes RWI connections, becoming a radio operator for the operation (D, fig. 6-15). In a third arrangement ((3) below), the distant radio station operator is provided with an O-574/GRA which will provide the 1,600-cps signal to ring through an unattended AN/GSA-7 to call the switchboard (C, fig. 6-15).

(1) *Radio operator at AN/GSA-7.* These procedures require a radio operator at the AN/GSA-7.

(*a*) Interconnect the AN/GSA-7 equipment (*b* above).

(*b*) At the AN/GSA-7, set the monitor switch to T RADIO&MON position. Use the H-33/PT to communicate with the distant radio station.

(*c*) When RWI is required for communication with a switchboard subscriber, advise the distant radio station to stand by while the arrangements in *1* through *3* below are being made:

1. On the AN/GSA-7, hold the monitor switch at R TEL to ring the switchboard. Release the switch, and request the switchboard operator for connection with the desired subscriber.

2. At the switchboard, the operator connects the operator's cord to the desired subscriber's jack, rings, advises the subscriber of the radio call, and the call signs, and requests him to ring back when the radio communication is completed.

3. The switchboard operator then connects the subscriber's cord to the radio link jack (B, fig. 6-16) and tells the radio operator that the subscriber is ready.

(*d*) At the AN/GSA-7, the radio operator sets the AN/GSA-7 monitor switch to T RADIO&MON position. Communication between the subscriber and the distant radio station proceeds automatically on push-to-talk operation. The radio operator at the AN/GSA-7 can monitor the communication.

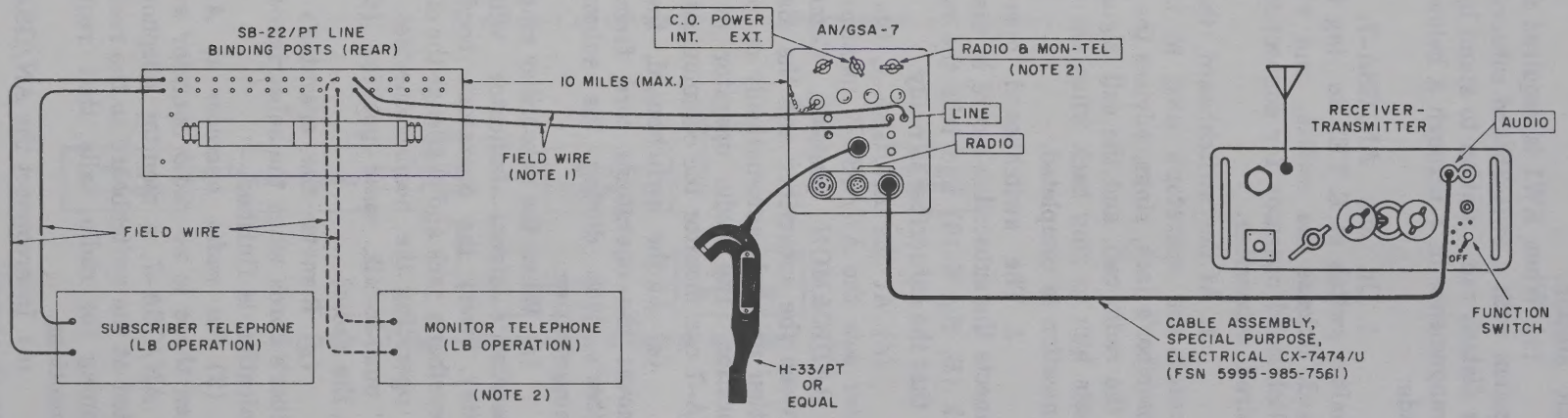
(*e*) At the switchboard, the operator removes the operator's cord from the subscriber's jack during the subscriber-radio communication.

(*f*) When the subscriber rings off (the subscriber's signal indicator will indicate white), insert the operator's cord into the subscriber's jack and challenge the circuit without operating the headset-chestset switch to the push-to-talk *radio* position (this would key the radio).

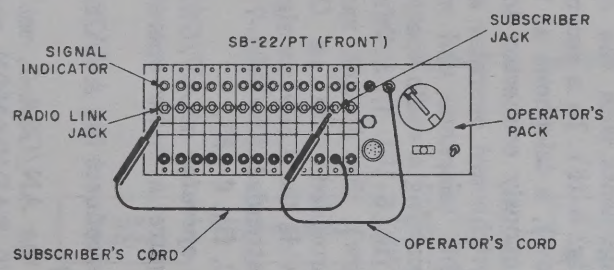
(*g*) Remove the operator's and subscriber's cords when the subscriber-radio communication is finished.

(2) *No radio operator at AN/GSA-7.* When there is no radio operator available at the AN/GSA-7, a monitor telephone is connected at the switchboard to the radio link for listening for radio calls that require RWI connections.

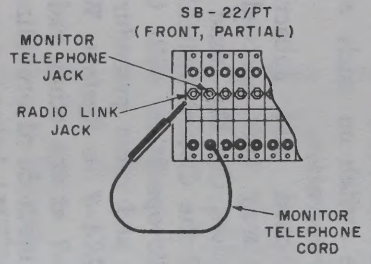
(*a*) Interconnect the AN/GSA-7 equipment (*b* above).



A. CONNECTIONS AND SWITCH POSITIONS.



B. CORD CONNECTIONS FOR OPERATOR AND SUBSCRIBER COMMUNICATION ON RADIO LINK.



C. CORD CONNECTION FOR MONITOR TELEPHONE (NOTE 2).

NOTES:

1. IF RECEIVER-TRANSMITTER IS KEYED, TRANSPOSE THESE CONNECTIONS AT SB-22/PT.
2. THE MONITOR TELEPHONE IS LOCATED AT SB-22/PT TO ENABLE SWITCHBOARD OPERATOR TO HEAR INCOMING RADIO CALLS ON THE HANDSET WHEN THERE IS NO OPERATOR AT THE AN/GSA-7.

TM5820-398-12-C2-12

Figure 6-16. Radio Set Control AN/GSA-7 with RT-841/PRC-77 to provide RWI; connections and control settings.

(*b*) Connect a monitor telephone to the switchboard (A, fig. 6–16); set it for LB operation, and place the telephone handset so that the switchboard operator can hear radio calls. Connect the monitor telephone cord to the radio link jack (C, fig. 6–16).

(*c*) To communicate with the distant radio station, insert the operator's cord into the monitor telephone jack (C, fig. 6–16). Operate the switchboard handset-chestset switch to the push-to-talk *radio* position to key the radio and communicate with the distant radio station; use proper call signs and radio procedure.

(*d*) When a radio call is heard on the monitor telephone handset, use the monitor telephone to answer the call. When the desired subscriber has been determined, advise the distant radio station to stand by while the arrangements in *1* and *2* below are being made.

1. Insert the operator's cord into the subscriber's jack, ring, and advise the subscriber of the radio call and the call signs; request him to ring back when the radio communication is finished.

2. Remove the monitor telephone cord from, and connect the subscriber's cord to, the radio link jack. Communication between the subscriber and distant radio station proceeds automatically with push-to-talk radio operation.

(*e*) Remove the operator's cord from the subscriber's jack.

(*f*) When the subscriber rings off (the subscriber's signal indicator will show white), insert the operator's cord into the subscriber's jack, and challenge the circuit without operating the headset-chestset switch to the push-to-talk *radio* position (this would key the radio).

(*g*) Remove the operator's cord from the subscriber's jack, and reconnect the monitor telephone cord to the radio link jack (C, fig. 6–16) to await further radio calls.

(3) *O–574/GRA provided at radio.* When one radio is connected to the AN/GSA–7 and another radio is provided with the O–574/GRA–7 (C, fig. 6–15), operation can proceed as though there were two AN/GSA–7's in the system.

(*a*) Interconnect the AN/GSA–7 equipment (*b* above).

(*b*) Connect the O–574/GRA to the receiver-transmitter (C, fig. 6–15).

(*c*) When the radio operator with the O–574/GRA desires to call the switchboard, he presses the RING switch on the O–574/GRA for a few seconds. The switchboard operator answers and makes the necessary connection to the subscriber.

(*d*) When the switchboard operator desires to call a radio operator who is provided with an O–574/GRA, he can either ring or use the call sign on the radio link line. IF the switchboard operator uses ringing to call, the O–574/GRA user must be aware of the 1,600-cps buzz in his audio accessory, alerting him to a call from the switchboard operator.

6–9. Control Group AN/GRA–6

The AN/GRA–6 (TM 11–5038) may be used for remote radio control of the radio transmission and reception of the radio set at a separation of 2 miles (1.6 km, approximately) (*a* below). This equipment may also be used to provide RWI between Switchboard, Telephone SB–22/PT (TM 11–5805–262–12) and the radio set (*b* below). Cable Assembly, Special Purpose, Electrical CX–7474/U (FSN 5995–985–7561) (fig. 6–14) is required for the connection between the receiver-transmitter and Local Control C–434/GRC (A, fig. 6-18). Remote Control C–433/GRC is connected to the C–434/GRC with field wire.

a. Remote Radio Control.

(1) *Connections.*

(*a*) Install the batteries in the C–434/GRC and C–433/GRC units of the AN/GRA–6 (TM 11–5038).

(*b*) Place the C–434/GRC unit next to the RT-841/PRC-77 and interconnect the two units with the CX–7474/U (A, fig. 6-18).

(*c*) Connect a handset to the RT-841/PRC-77; it will be used by the radio operator for radio communication.

(*d*) Interconnect the C–434/GRC and C–433/GRC units with field wire.

(*e*) To check for proper connection of the field wire to the units, perform the following operations:

1. Turn on the RT-841/PRC-77 by setting the function switch to ON. A rushing noise should be heard on the handset.

2. At the C–434/GRC unit (local), set the REMOTE switch to SET 1.

Warning: **Voltages as high as 45 volts dc are present on the field wire when the radio is keyed from the remote control unit.**

3. At the C–433/GRC unit (remote), set the SELECTOR switch to fully counterclockwise (for the left-hand write-in position). Operate the handset push-to-talk switch, and check to see that the RT-841 PRC-77 has been keyed. If it has not been keyed, release the push-to-talk switch and reverse the field wire connection to the LINE binding posts of either control unit. Recheck the keying of the RT-841/PRC-77.

(2) *Telephone operation between control units.* To prevent accidental keying of the radio by the C–433/GRC unit handset, always set the REMOTE switch on the C–434/GRC unit to TEL ONLY.

(*a*) To ring from either the C–434/GRC or C–433/GRC, crank the handle of the ringing generator.

(*b*) To communicate between the two control units, proceed as follows:

1. At the C–434/GRC, set the LOCAL switch to TEL; at the C–433/GRC, set the SELECTOR switch to TEL.

2. Remove the CX–7474/U from the C–434/GRC AUDIO connector, and replace it with an H–33/PT (or equal).

3. Communicate between the two control units using the associated handsets.

(3) *Radio communication.* Check to see that the CX–7474/U is connected between the C–434/GRC and the RT–505/PRC–25 (A, fig. 6-18).

(*a*) To communicate on the radio at the C–434/GRC, use the handset connected to the RT-841/PRC-77 (A, fig. 6-18).

(*b*) To communicate on the radio from the C–433/GRC, proceed as follows:

1. At the C–434/GRC, set the REMOTE switch to SET 1.

2. At the C–433/GRC, set the SELECTOR switch fully counterclockwise ((1) (*e*)*3* above).

3. Operate the H–33/PT at the C–433/GRC to communicate on the radio using push-to-talk radio operation with the proper call signs and radio procedure.

b. RWI Operation

(1) *Connections.*

(*a*) Install batteries in the C–434/GRC and C–433/GRC (TM 11–5038).

(*b*) Locate the C–434/GRC beside the RT-841/PRC-77 and interconnect the two units with the CX–7474/U (B, fig. 6-18).

(*c*) Locate the C–433/GRC beside the switchboard, and interconnect the C–434/GRC and C–433/GRC and the SB–22/PT with field wire.

(*d*) Position a monitor telephone next to the switchboard, and connect it to one of the line binding posts of the switchboard.

(*e*) To check for proper connection of the field wire, perform the following operations:

1. Turn on the RT-841/PRC-77 by setting the function switch to ON. Connect a handset to the RT-841/PRC-77; a rushing noise from the radio should be heard.

2. At the C–434/GRC, set the REMOTE switch to SET 1.

3. At the C–433/GRC, set the SELECTOR switch fully counterclockwise (for the left-hand write-in position).

4. At the C–433/GRC, connect an H–33/PT to the AUDIO connector (B, fig. 6-18); tape the push-to-talk switch of the handset so that it is always operated.

5. At the switchboard, connect the operator's cord to the radio link jack and operate the switch on the operator's headset-chestset to the push-to-talk radio position to key the radio. If the radio is not keyed, release the switch and reverse the connections of the field wire to the switchboard binding posts. Recheck the keying of the radio with the switchboard operator's set.

(*f*) Connect the monitor telephone cord to the radio link jack (D, fig. 6-18); set it for LB operation, and place the telephone handset so that the switchboard operator can hear radio calls.

(2) *Operation.* The monitor telephone connected at the switchboard to the radio link will be used by the operator to hear incoming radio calls requiring RWI.

(*a*) To communicate on the radio from the RT-841/PRC-77, use the handset connected to the radio.

(*b*) To use the telephone circuit between the C-434/GRC and C-433/GRC, connect an H-33/PT to the C-434/GRC in place of the CX-7474/U and use the procedures given in *a*(2) above.

(*c*) For the switchboard operator to communicate on the radio, proceed as follows:

1. Connect the operator's cord to the radio link jack.

2. Use the push-to-talk radio position of the headset-chestset switch to key the radio, and release the switch to receive the radio communication.

(*d*) When a radio call is heard on the monitor telephone, insert the operator's cord into the monitor telephone jack. When the desired subscriber has been determined, advise the distant station to stand by while the arrangements in *1* and *2* below are being made.

1. Insert the operator's cord into the subscriber's jack, ring, and advise the subscriber of the radio call and call signs; request him to ring back when the radio communication is completed.

2. Remove the monitor telephone cord (D, fig. 6-18) from, and connect the subscriber's cord to, the radio link jack (C, fig. 6-18). Communication between the subscriber and distant station proceeds automatically with push-to-talk radio operation.

(*e*) Remove the operator's cord from the subscriber's jack.

(*f*) When the subscriber rings off (the subscriber's signal indicator will show white), insert the operator's cord into the subscriber's jack and challenge the circuit without operating the headset-chesset switch to push-to-talk *radio* position (this would key the radio).

(*g*) Remove the operator's cord from the subscriber's jack, and reconnect the monitor telephone cord to the radio link jack (D, fig. 6-18) to await further radio calls.

6-19. Operation with TSEC/KY-38.

The radio set can be used with the TSEC/KY-38 (security equipment) when secure operation is required.

a. Security Requirements.

(1) Operators of the TSEC/KY-38 and AN/PRC-77 system must have a clearance at least as high as the highest level of traffic to be passed; a minimum clear-

TM 11-5820-667-12

ance of confidential is required. Operators may not remove covers from the TSEC/KY-38. *Internal access to the TSEC/KY-38 requires formal cryptographic authorization.*

(2) Keyed equipments shall be kept under direct continuous United States control to prevent tampering or unauthorized viewing.

Note. The TSEC/KY-38 is a half duplex equipment that is not capable of transmitting and receiving simultaneously. If two or more stations attempt to transmit at the same time, the entire net will be out of communications; therefore, net discipline is mandatory.

b. Installation of AN/PRC-77.

(1) Perform the battery and antenna installation procedures for the radio set as instructed in chapter 2 of this manual.

(2) Set the carrying frame (fig 6-17) upright on the ground against a tree or wall.

(3) On the carrying frame, unbuckle both straps above the upper shelf.

(4) Set the bottom of the radio set on top of the upper shelf on the carrying frame (fig. 6-17).

(5) Buckle both straps around the radio set.

(6) Connect one end of Cable CX-10475/U to the POWER connector on the radio set.

c. Installation of TSEC/KY-38.

(1) Install either a single or double (as needed) Battery, Dry BA-386/PRC-25 in the security equipment battery case.

(2) Set the key of the day in the TSEC/KYK-28 as described in (*a*) through (*g*) below:

(*a*) Remove the TSEC/KYK-28 from its protective canvas bag.

(*b*) Open the code gun like a book by depressing the locking device located on the right-hand side (viewing the code gun with the nameplate in the upright position).

(*c*) Push the two locking ears located on the sides of the TSEC/KYK-28 to the rear position.

(*d*) Set the various slides in accordance with the extract key material.

Note. A valid key must be used or the TSEC/KY-38 will not complete the check cycle and an alarm condition will result.

(*e*) Move the locking ears ((*c*) above) forward.

(*f*) Close the code gun, and secure the locking device ((*b*) above).

(*g*) Check the gate mechanism by forcing the gate back to expose the keying pins. The four alignment feet must be exposed to assure proper operation.

(3) Open the access door on the TSEC/KY-38 and insert the TSEC/KYK-28 to key the security equipment.

(4) Remove the TSEC/KYK-28 and make sure that the access door on the security equipment is closed.

(5) On the TSEC/KYK-28 perform the following:

(*a*) Unlock the open the TSEC/KYK-28.

(*b*) Move the locking ears to the rear.

(*c*) Move all slides to the zeroized position.

(*d*) Move the locking ears forward.

(*e*) Close and lock the TSEC/KYK-28.

(*f*) Place and TSEC/KYK-28 into its protective canvas bag.

(6) On the carrying frame, unbuckle and remove both straps above the lower shelf.

(7) Install one of the straps in the third slot from the bottom of the carrying frame.

(8) Set the left-hand side of the security equipment on the lower shelf of the carrying frame.

Note. The controls of the security equipment will face the left-hand side of the individual wearing the carrying frame.

(9) Buckle the strap around the security equipment.

(10) Connect the other end of cable CX-10475/U (*b*(6) above) to the RADIO connector on the security equipment.

(11) Connect on H-189/GR to the AUDIO connector on the security equipment.

d. Operation.

(1) On the TSEC/KY-38, set the POWER switch to CIPHER and the VOLUME control to the fully clockwise position.

(2) On the AN/PRC-77, set the function switch to ON and the VOLUME control fully clockwise.

Note. Receiver noise should be heard on the handset indicating proper operation of the automatic plain cipher function.

(3) Set the DELAY switch on the TSEC/KY-38 to IN.

(4) On the AN/PRC-77, set the function switch to ON or SQUELCH and the frequency controls to the operating frequency.

(5) On both the AN/PRC-77 and TSEC/KY-38, place the appropriate covers on the unused connectors.

Note. Radio Sets AN/PRC-77 serial numbers 1 through 899 on Order Number FR 36-039-H-32018(E) are *not* to be operated in the 51.5 to 54.0 mc frequency channels when used with the TSEC/KY-38.

(6) Press the push-to-talk switch on the H-189/GR. A multitone signal will be heard followed by a final beeptone, then no tone. This sequence of events indicates overall system operation.

Note. System failure is indicated by either a continuous tone or a series of beeps in the H-189/GR when the push-to-talk switch is pressed. If this condition exists, zeroize the TSEC/KY-38 and reset the TSEC/KY-38 with the TSEC/KYK-38. If system failure still occurs, replace the batteries.

(7) If the plain mode of operation is needed, set the POWER switch on the TSEC/KY-38 to PLAIN.

(8) Adjust the volume as shown below:

(*a*) When the TSEC/KY-38 POWER switch is set to CIPHER, adjust the VOLUME control on the security equipment. Some adjustment of the VOLUME control may be required on the radio set when plain information is being received.

(*b*) If the TSEC/KY-38 POWER switch is set to PLAIN, adjust the VOLUME control on the AN/PRC-77.

e. Zeroizing the Security Equipment.

(1) Zeroize the TSEC/KYK-28 by performing the steps in *c*(5) above.

(2) On the TSEC/KY-38 open the access panel fully then close the panel.

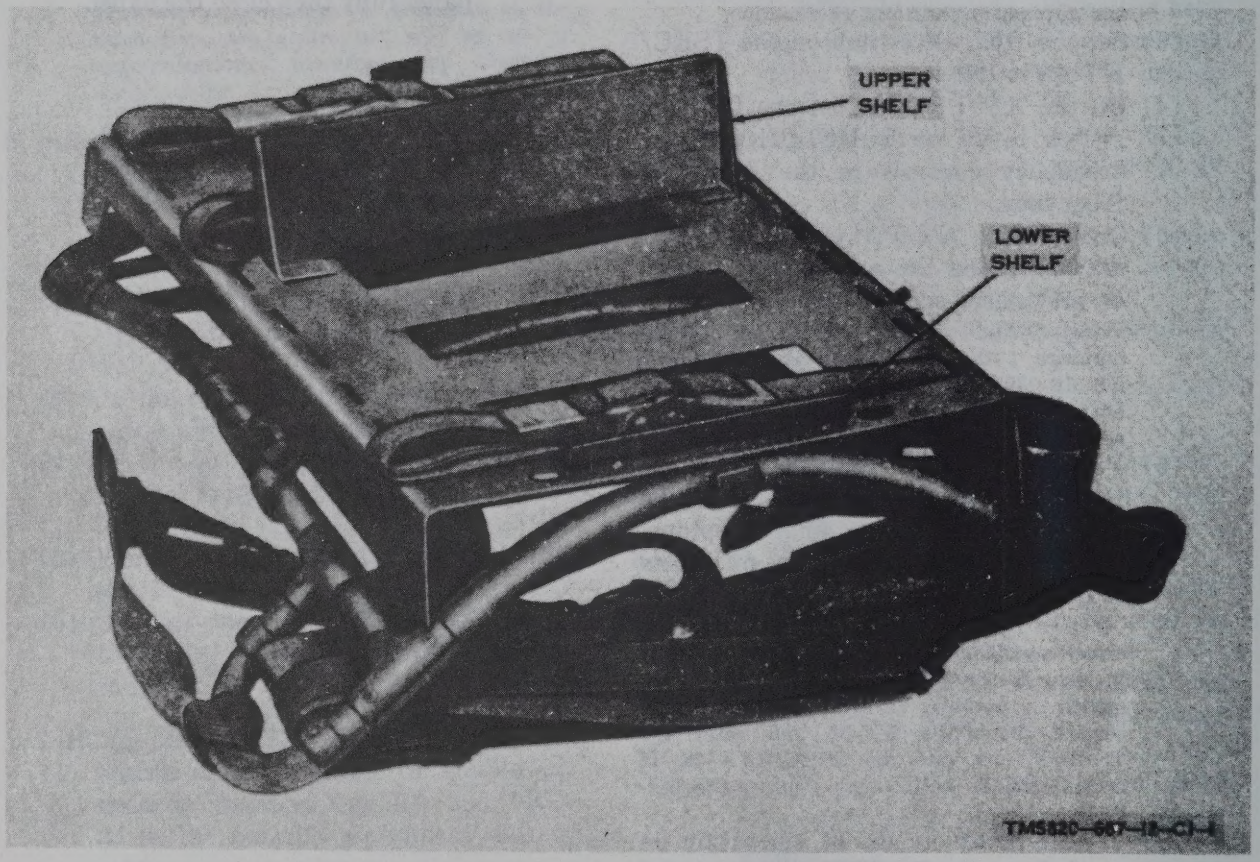


Figure 6-17. Carrying frame.

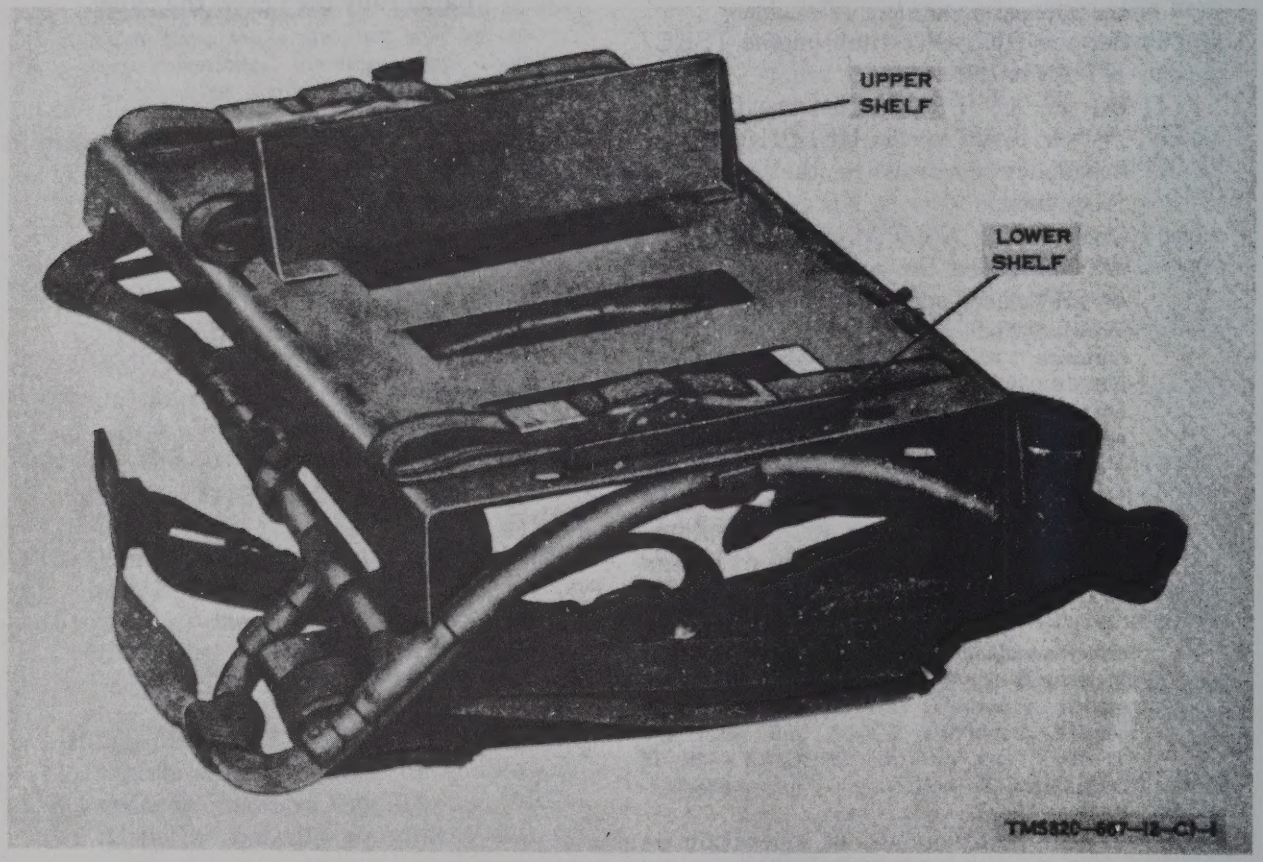


Figure 6–17. Carrying frame.

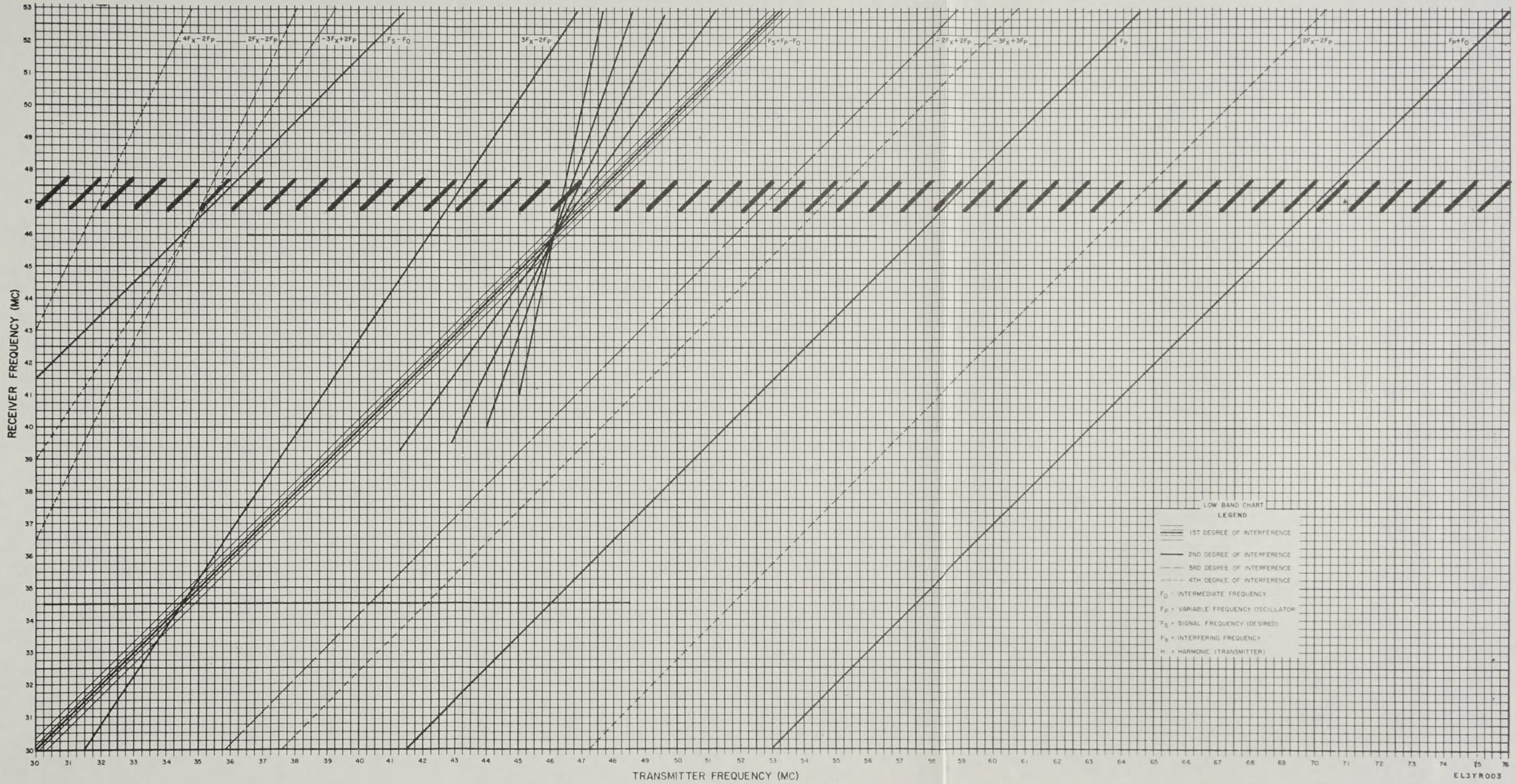
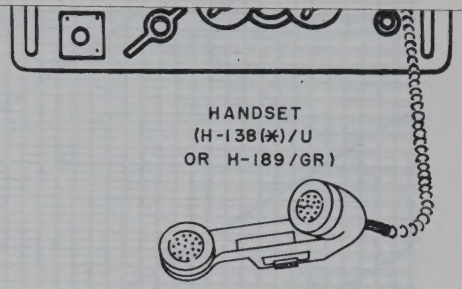
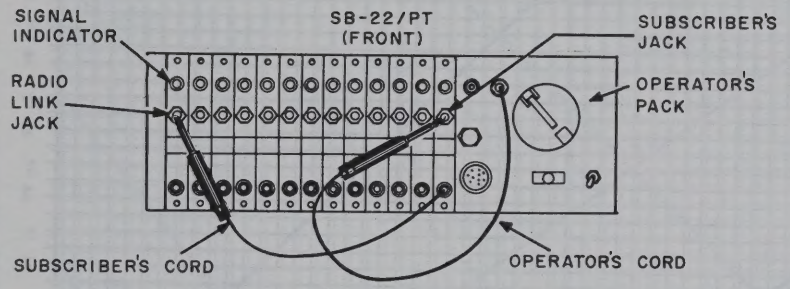


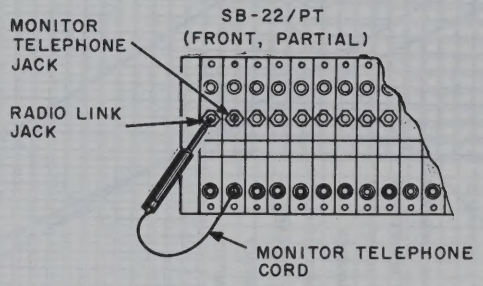
Figure 6-18. AN/GRA-6 and RT-841/PRC-77 connections and control settings for RWI and remote control operation.



B. RWI CONNECTIONS.



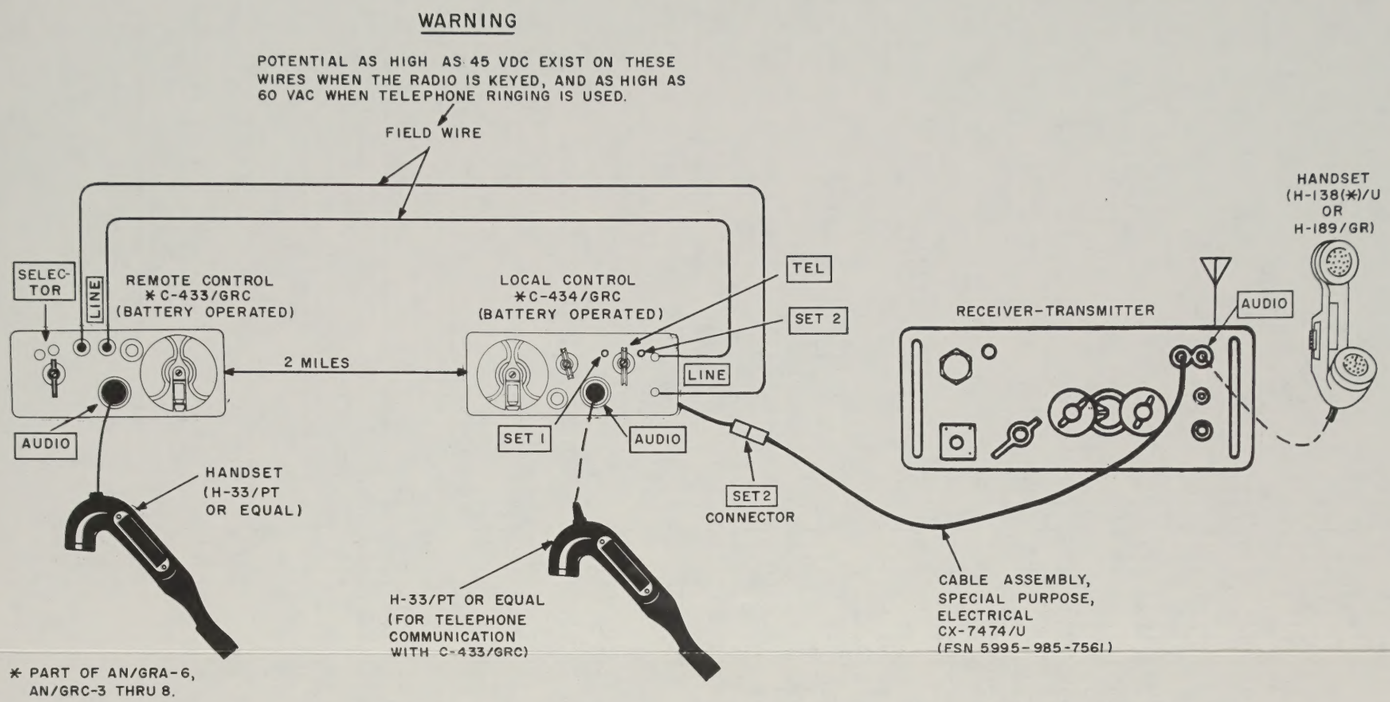
C. SWITCHBOARD CONNECTIONS FOR SUBSCRIBER- RADIO LINK, RWI.



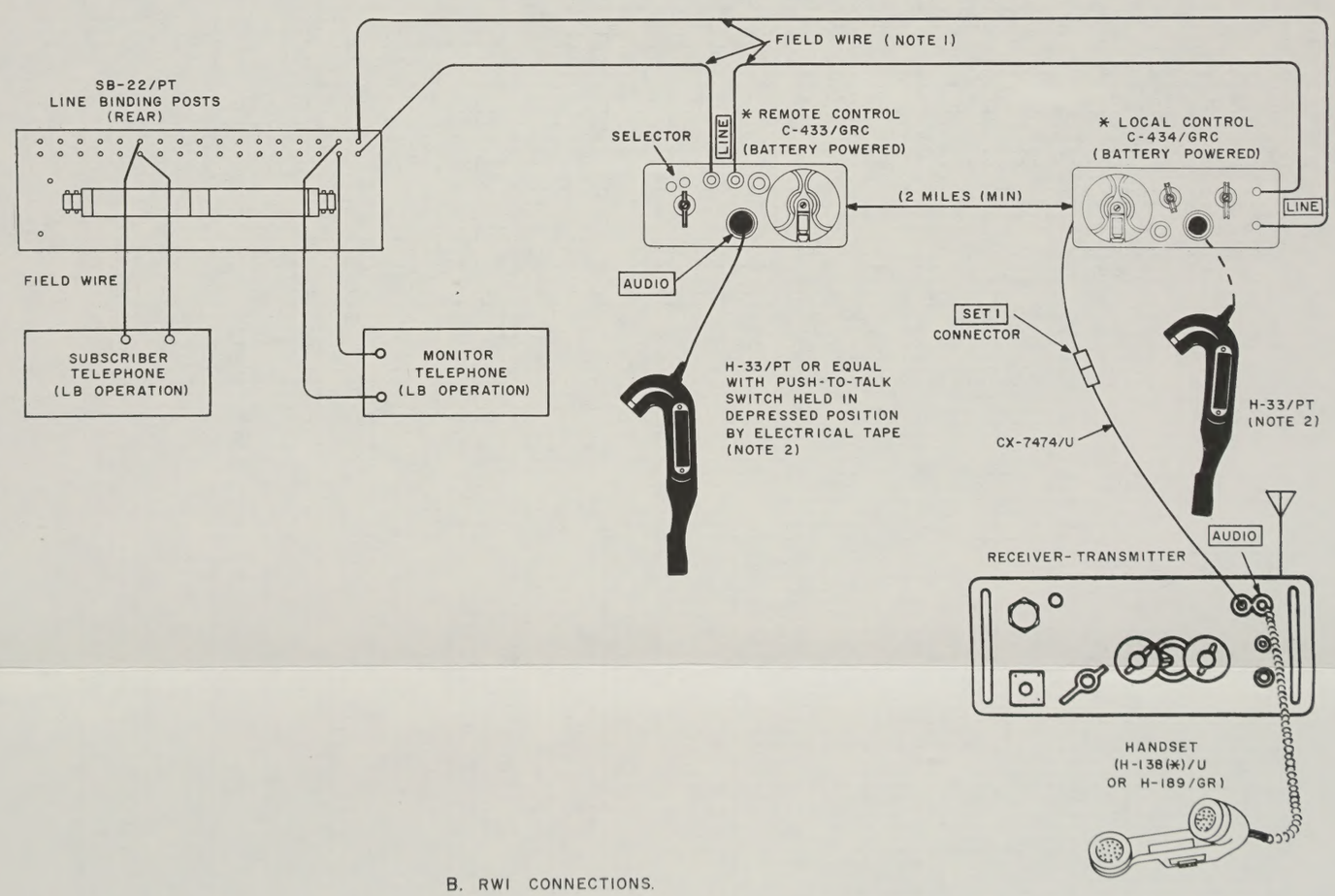
D. CORD CONNECTION FOR MONITOR TELEPHONE.

NOTES:

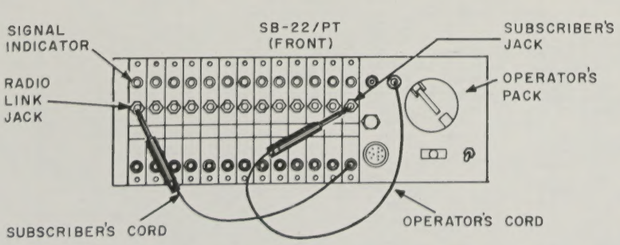
1. IF THE RADIO IS KEYED, TRANSPOSE CONNECTION OF THESE WIRES AT SB-22/PT.
2. REQUIRED FOR TELEPHONE COMMUNICATION WITH SWITCHBOARD.
3. * PART OF AN/GRA-6.



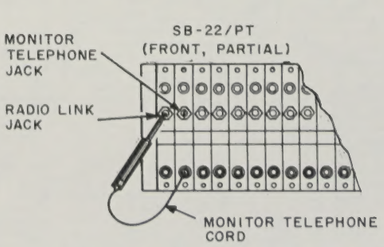
A. REMOTE CONTROL CONNECTIONS.



B. RWI CONNECTIONS.



C. SWITCHBOARD CONNECTIONS FOR SUBSCRIBER- RADIO LINK, RWI.

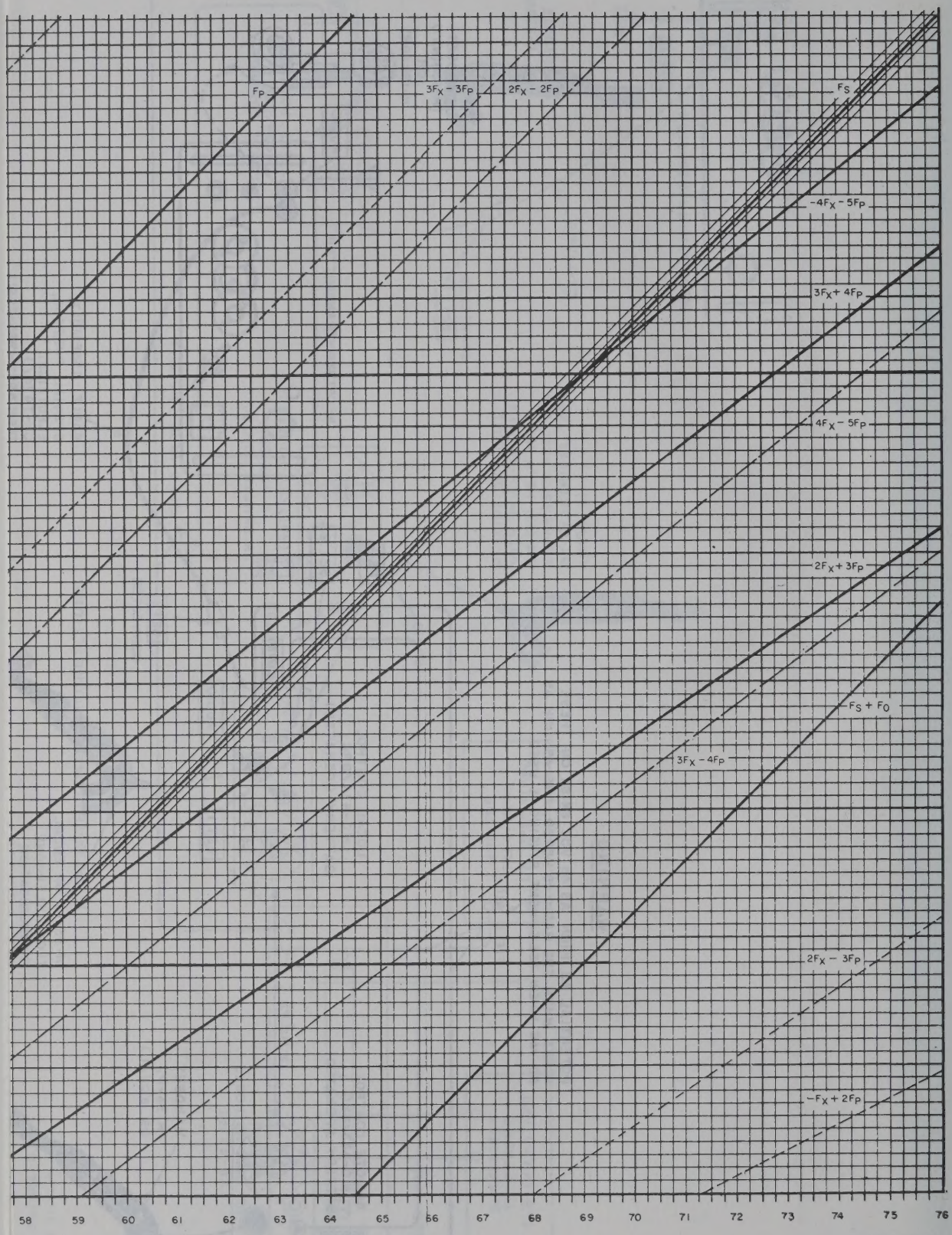


D. CORD CONNECTION FOR MONITOR TELEPHONE.

NOTES:

1. IF THE RADIO IS KEYED, TRANSPOSE CONNECTION OF THESE WIRES AT SB-22/PT.
2. REQUIRED FOR TELEPHONE COMMUNICATION WITH SWITCHBOARD.
3. * PART OF AN/GRA-6.

Figure 6-19 Q. Retransmission interference chart (sheet 1 of 2).


F_P
$3F_X - 3F_P$
$2F_X - 2F_P$
F_S
$-4F_X - 5F_P$
$3F_X + 4F_P$
$4F_X - 5F_P$
$2F_X + 3F_P$
$F_S + F_O$
$3F_X - 4F_P$
$2F_X - 3F_P$
$-F_X + 2F_P$
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EL3YR004

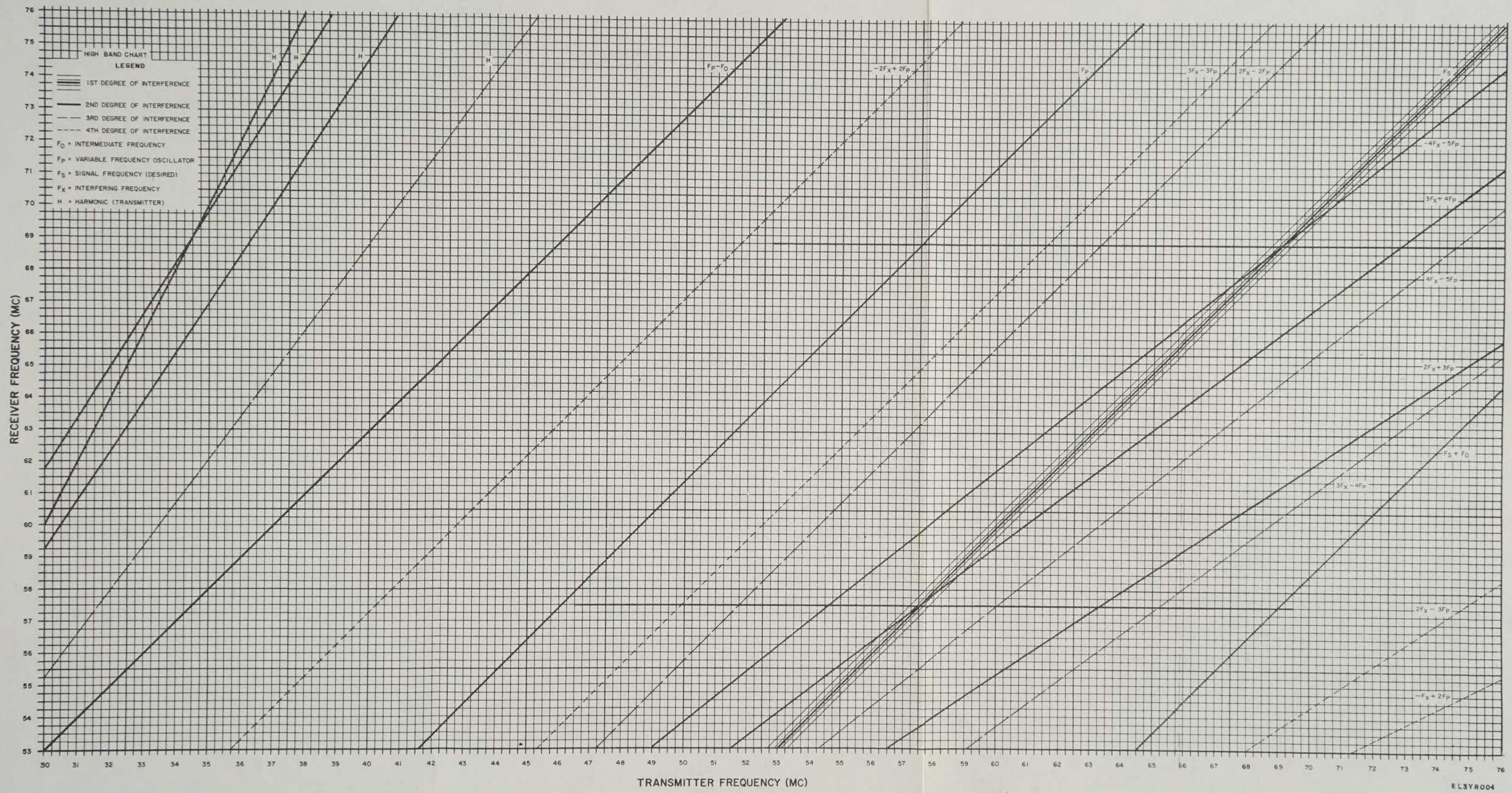


Figure 6–19②. Retransmission interference chart (sheet 2 of 2).

APPENDIX A

REFERENCES

DA Pam 310-4	Index of Technical Manuals, Technical Bulletins, Supply Manuals (Types 7, 8, and 9), Supply Bulletins, and Lubrication Orders.
DA Pam 310-7	US Army Equipment Index of Modification Work Orders.
SB 11-6	FSC Class 6135; Dry Battery Supply Data.
SB 11-131	Vehicular Radio Sets and Authorized Installations.
SB 11-573	Painting and Preservation Supplies Available for Field Use for Electronics Command Equipment.
SB 11-576	Cold Weather Batteries for Radio Sets AN/PRC-6, -8, -8A, -9A, -10A, -28, -25, and -77 and Cable Assemblies for Cold Weather Operation of Transmitting Set AN/PRT-4 and Receiving Set AN-PRR-9.
TB 43-0118	Field Instructions for Painting and Preserving Electronics Command Equipment Including Camouflage Pattern Painting of Electrical Equipment Shelters.
TB SIG 291	Safety Measures to be Observed When Installing and Using Whip Antennas, Field-Type Masts, Towers and Antennas and Metal Poles That are Used with Communications, Radar and Direction Finder Equipment.
TM 11-5038	Control Group AN/GRA-6.
TM 11-5135-15	Radio Set Control AN/GSA-7 (NSN 5820-00-543-1397).
TM 11-5805-262-12	Operator's and Organizational Maintenance Manual: Switchboards, Telephone, Manual SB-22/PT (NSN 5805-00-257-3602) and SB-22A/PT (5805-00-715-6171).
TM 11-5820-348-15	Organizational, Direct Support, General Support and Depot Maintenance Manual: Antenna Equipment RC-292.
TM 11-5820-398-12	Operator's and Organizational Maintenance Manual (Including Repair Parts and Special Tools Lists): Radio Set AN/PRC-25 (Including Receiver-Transmitter, Radio RT-505/PRC-25).
TM 11-5820-401-10-1	Radio Sets AN/VRC-12 (NSN 5820-00-223-7412), AN/VRC-43 (5820-00-223-7415), AN/VRC-44 (5820-00-223-7417), AN/VRC-45 (5820-00-223-7418), AN/VRC-46 (5820-00-223-7433), AN/VRC-47 (5820-00-223-7434), AN/VRC-48 (5820-00-223-7435), and AN/VRC-49 (5820-00-223-7437) (Used Without Intercom System).
TM 11-5820-401-10-2	Radio Sets AN/VRC-12 (NSN 5820-00-223-7412), AN/VRC-43 (5820-00-223-7415), AN/VRC-44 (5820-00-223-7417), AN/VRC-45 (5820-00-

223-7418), AN/VRC-46 (5820-00-223-7433), AN/VRC-47 (5820-00-223-7434), AN/VRC-48 (5820-00-223-7435), and AN/VRC-49 (5820-00-223-7437) (Used With an Intercom System).

TM 11-5820-401-12 — Operator's and Organizational Maintenance Manual (Including Repair Parts and Special Tools Lists): Radio Sets AN/VRC-12 (5820-00-223-7412), AN/VRC-43 (5820-00-223-7415), AN/VRC-44 (5820-00-223-7417), AN/VRC-45 (5820-00-223-7418), AN/VRC-46 (5820-00-223-7433), AN/VRC-47 (5820-00-223-7434), AN/VRC-48 (5820-00-223-7435), AN/VRC-49 (5820-00-223-7437), AN/VRC-54 (5820-00-223-7567), and AN/VRC-55 (5820-00-402-2265); Mounting MT-1029/VRC (5820-00-893-1323) and MT-1898/VRC (5820-00-893-1324); Antenna AT-912/VRC (5820-00-897-6357); Control, Frequency Selector C-2742/VRC (5820-00-892-3343) and Control, Radio Set C-2299/VRC (5820-00-892-3340).

TM 11-5820-477-12 — Operator's and Organizational Maintenance Manual: Radio Set Control Groups AN/GRA-39 (NSN 5820-00-889-3860); AN/GRA-39A (NSN 5820-00-949-9909), and AN/GRA-39B (NSN 5820-00-949-9909).

TM 11-5820-498-12 — Operator's and Organizational Maintenance Manual: Radio Sets AN/VRC-53 (5820-00-223-7467), AN/VRC-64 (5820-00-223-7475), AN/GRC-125 (5820-00-223-7411) and AN/GRC-160 (5820-00-223-7473) and Amplifier-Power Supply Groups OA-3633/GRC and OA-3633/A/GRC (5820-00-973-3333).

TM 11-5820-667-20P — Organizational Maintenance Repair Parts and Special Tools Lists: Radio Set AN/PRC-77 (NSN 5820-00-930-3724).

TM 11-5985-284-15 — Operator's, Organizational, DS, GS, and Depot Maintenance Manual: Antenna, Loop AT-784/PRC (NSN 5820-00-086-7651).

TM 11-5985-357-13 — Operator's, Organizational, and Direct Support Maintenance Manual for Antenna Group OE-254/GRC.

TM 11-6625-203-12 — Operator and Organizational Maintenance: Multimeter AN/URM-105 and AN/URM-105C Including Multimeter ME-77/U and ME-77C/U.

TM 11-6625-1686-15 — Operator, Organizational, Direct Support, General Support, and Depot Maintenance Manual (Including Repair Parts and Special Tool Lists): Radio Frequency Power Test Set TS-2609/U.

TM 11-6625-2718-14&P — Operator's, Organizational, Direct Support and General Support Maintenance Manual Including Repair Parts and Special Tools List: Test Set, Radio Frequency Power AN/URM-182 (NSN 6625-00-148-9371).

TM 38-750 — The Army Maintenance Management System (TAMMS).

TM 750-244-2 — Procedures for Destruction of Electronics Materiel to Prevent Enemy Use (Electronics Command).

APPENDIX B

COMPONENTS OF END ITEM LIST

Section I. INTRODUCTION

B-1. Scope

This appendix lists integral components of Radio Set AN/PRC-77 to help you inventory items required for safe and efficient operation.

B-2. General

The Components of End Item List is divided into the following sections:

a. Section II. Integral Components of the End Item. These items, when assembled, comprise the AN/PRC-77 and must accompany it whenever it is transferred or turned in. The illustration will help you identify these items.

b. Section III. Basic Issue Items. Not used.

B-3. Explanation of Columns

a. Illustration. This column is divided as follows:

(1) *Figure number.* Indicates the figure number of the illustration on which the item is shown.

(2) *Item number.* Not used.

b. National Stock Number. Indicates the National stock number assigned to the item and which wil be used for requisitioning.

c. Part Number. Indicates the primary number used by the manufacturer, which controls the design and characteristics of the item by means of its engineering drawings, specifications, standards, and inspection requirements to identify an item or range of items. Following the part number the federal supply code for manufacturers (FSCM) is shown in parentheses.

d. Description. Indicates the Federal item name and, if required, a minimum description to identify the item.

e. Location. Not used.

f. Usable on Code. Not used.

g. Quantity Required (Qty Reqd). This column lists the quantity of each item required for a complete major item.

h. Quantity. This column is left blank for use during an inventory. Under the Rcv'd column, list the quantity you actually received on your major item. The Date columns are for your use when you inventory the major item at a later date such as for shipment to another site.

SECTION II INTEGRAL COMPONENTS OF END ITEM

(1) ILLUSTRATION (A) FIG NO.	(1) ILLUSTRATION (B) ITEM NO.	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION PART NUMBER	(3) DESCRIPTION (FSCM)	(4) LOCATION	(5) USABLE ON CODE	(6) QTY REQD	(7) QUANTITY RCVD	(7) QUANTITY DATE
1-2		5820-00-930-3724	RADIO SET AN/PRC-77						
1-2		5820-00-242-4967	ANTENNA 271A/PRC	(80063)					
1-2		5820-00-889-3803	ANTENNA 892/PRC-25	(80063)					
1-2		5820-00-086-7148	BATTERY BOX CY-2562/PRC-25	(80063)					
1-2		5965-00-069-8886	HANDSET H-189/GR	(80063)					
1-2		5820-00-892-8094	HARNESS, ELECTRICAL EQUIPMENT ST-138/PRC-25	(80063)					
1-2		5820-00-930-3725	RECEIVER-TRANSMITTER, RADIO RT-841/PRC-77	(80063)					
1-2		5820-00-086-7149	SUPPORT, ANTENNA AB-591/PRC	(80063)					
1-2		5820-00-086-7138	BAG, COTTON DUCK CW-503/PRC-25	(80063)					

APPENDIX C

MAINTENANCE ALLOCATION

Section I. INTRODUCTION

C–1. General

This appendix provides a summary of the maintenance operations for the AN/PRC–77. 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. Maintenance Function

Maintenance functions will be limited to and defined as follows:

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

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

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

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

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

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

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

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

i. Repair. The application of maintenance services (inspect, test, service, adjust, align, calibrate, replace) or other maintenance actions (welding, grinding, riveting, straightening, facing, remachining, or resurfacing) to restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, subassembly, module (component or assembly), end item, or system.

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

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

C-3. Column Entries

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

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

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

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

C—Operator/Crew
O—Organizational
F—Direct Support
H—General Support
D—Depot

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

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

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

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

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

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

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

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

C-5. Remarks (Sec IV)

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

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

(Next printed page is C-3)

SECTION II MAINTENANCE ALLOCATION CHART FOR

RADIO SET AN/PRC-77

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY C	O	F	H	D	(5) TOOLS AND EQPT.	(6) REMARKS
00	RADIO SET AN/PRC-77	Inspect	0.1						
		Test	0.1						A
		Service	0.1						B
		Repair	0.1						C
		Repair		0.1				2	D
		Overhaul					80.0		E
01	ANTENNA AS-2109/PRC	Inspect	0.1						F
		Replace	.05						I,V
		Repair		0.2				2	G
02	HARNESS, ELECTRICAL EQUIPMENT ST-138/PRC-25	Inspect	0.1						F
		Replace	0.1						I
		Repair				0.5			H
03	BAG, COTTON DUCK CW-503/PRC-25	Inspect	0.1						F
		Replace	0.1						I
		Repair				0.5			H
04	HANDSET H-189/GR (See TM 11-5965-280-15 for Maintenance allocation)	Replace		0.1					
05	RECEIVER-TRANSMITTER RT-841/PRC-77	Inspect	0.1						F
		Test	0.1						A
		Test		0.25				1,2,24	
		Test			0.5			3 thru 12, 17, 18	
		Test				1.0		4 thru 19	
		Test					2.0	6 thru 12, 15 thru23	
		Service	0.1						J
		Align			1.0			3,4,8,9, 11,12	
		Align				1.5		4 thru 19	
		Align					2.0	6 thru 12, 15 thru23	
		Replace		0.1				2	
		Repair		0.1				2	O
		Repair			0.5			3 thru 12	K
		Repair				1.5		4 thru 19	
		Repair					2.0	6 thru 12, 15 thru 23	
		Overhaul					80.0		L
0501	BATTERY BOX CY-2562/PRC-25 (A100)	Inspect	0.1						F
		Replace	0.05						I
		Repair		0.25					M
		Repair					0.5	11,12	
0502	FRONT PANEL ASSEMBLY (A300) (Includes Antenna Loading Network (A28))	Test			0.25			4	
		Test				0.25		4	
		Test					0.25	4	
		Replace				1.0		11,12	
		Repair				1.0		5,11,12	N
		Repair				1.2		5,11,12	T
		Repair					0.75	5,11,12	
		Overhaul					3.0	5,11,12	
0503	CHASSIS ASSEMBLY (A200)	Repair			0.25			11,12	P
		Repair				0.5		11,12	Q
		Repair					1.5	11,12,28	
0504	TRANSMITTER PA ASSEMBLY (A36)	Test			0.25			11,12	R
		Test					0.1	22,23	
		Replace			0.1			11,12	
		Repair					3.5	22	S
0505	TRANSMITTER VFO ASSEMBLY (A38)	Test			0.25			11,12	R
		Test					0.1	22,23	
		Replace			0.1			11,12	
		Repair					1.0	22	S
0506	SYNTHESIZER VFO ASSEMBLY (A39)	Test			0.25			11,12	R
		Test					0.1	22,23	
		Replace			0.1			11,12	
		Repair					1.5	22	S

SECTION II MAINTENANCE ALLOCATION CHART - CONTINUED
FOR
RADIO SET AN/PRC-77

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY					(5) TOOLS AND EQPT.	(6) REMARKS
			C	O	F	H	D		
0507	RECEIVER INPUT ASSEMBLY (A32)	Test			0.25			11,12	R
		Test					0.1	22,23	
		Replace			0.1			11,12	
		Repair					2.0	22	S
0508	FIRST RF AMPLIFIER ASSEMBLY (A33)	Test			0.25			11,12	R
		Test					0.1	22,23	
		Replace			0.1			11,12	
		Repair					1.0	22	S
0509	SECOND RF AMPLIFIER ASSEMBLY (A34)	Test			0.25			11,12	R
		Test					0.1	22,23	
		Replace			0.1			11,12	
		Repair					1.0	22	S
0510	RECEIVER MIXER ASSEMBLY (A35)	Test			0.25			11,12	R
		Test					0.1	22,23	
		Replace			0.1			11,12	
		Repair					0.5	22	S
0511	TRANSMITTER FREQUENCY CONTROL ASSEMBLY (A31)	Test			0.25			11,12	R
		Test					0.1	22,23	
		Replace			0.1			11,12	
		Repair					2.0	22	S
0512	MODULATOR ATTENUATOR BOARD ASSEMBLY (A60)	Test			0.25			5,11,12	
		Test					0.25	9,11,12	
		Replace			0.25			11,12	
		Repair			0.25			11,12	
0513	IPA MOTHER BOARD ASSEMBLY (A49)	Test			0.1			5	
		Replace			0.25			11,12	
		Repair				0.25		11,12	
0514	TRANSMITTER MIXER ASSEMBLY (A50)	Test			0.25			11,12	R
		Test					0.1	22,23	
		Replace			0.1			11,12	
		Repair					0.3	22	S
0515	TRANSMITTER IPA ASSEMBLY (A37)	Test			0.3			11,12	R
		Test					0.5	22,23	
		Replace			0.1			11,12	
		Repair					1.5	22	S
0516	AUDIO AND CONTROL CHASSIS ASSEMBLY (A57)	Test			0.25			5	
		Replace			0.5			11,12	
		Repair					1.0	23	
0517	RECEIVER IF AMPLIFIER LIMITER ASSEMBLY (A21)	Test			0.25			11,12	R
		Test					0.1	22,23	
		Replace			0.1			11,12	
		Repair					0.5	22	S
0518	RECEIVER AUDIO ASSEMBLY (A55)	Test			0.25			11,12	R
		Test					0.1	22,23	
		Replace			0.1			11,12	
		Repair					1.0	22	S
0519	TONE SQUELCH ASSEMBLY (A54 or A54A)	Test			0.25			11,12	R
		Test					0.1	22,23	
		Replace			0.1			11,12	
		Repair					1.0	22	S
0520	TONE GENERATOR ASSEMBLY (A23)	Test			0.25			11,12	R
		Test					0.25	22,23	
		Replace			0.1			11,12	
		Repair					1.0	22	S
0521	SPEECH AMPLIFIER LIMITER ASSEMBLY (A22)	Test			0.25			11,12	R
		Test					0.1	22	
		Replace			0.1			11,12	
		Repair					0.5	22	S
0522	SYNTHESIZER MOTHER BOARD ASSEMBLY (A56, A56A)	Test			0.25			5	
		Replace			0.5			11,12	
		Repair					0.5	23	S

SECTION II MAINTENANCE ALLOCATION CHART - CONTINUED
FOR

RADIO SET AN/PRC-77

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY					(5) TOOLS AND EQPT.	(6) REMARKS
			C	O	F	H	D		
0523	VOLTAGE REGULATOR ASSEMBLY (A16)	Test			0.25			11,12	R
		Test					0.25	22,23	
		Replace			0.1			11,12	
		Repair					0.75	22	S
0524	INTERVAL OSCILLATOR ASSEMBLY (A40)	Test			0.25			11,12	R
		Test					0.25	22,23	
		Replace			0.1			11,12	
		Repair					2.0	22	S
0525	PHASE COMPARATOR ASSEMBLY (A17)	Test			0.25			11,12	R
		Test					0.25	22,23	
		Replace			0.1			11,12	
		Repair					0.5	22	S
0526	5.6 MHz IF AMPLIFIER ASSEMBLY (A18)	Test			0.25			11,12	R
		Test					0.25	22,23	
		Replace			0.1			11,12	
		Repair					0.75	22	S
0527	DISCRIMINATOR SYNCHESIZER ASSEMBLY (A11)	Test			0.25			11,12	R
		Test					0.25	22,23	
		Replace			0.1			11,12	
		Repair					0.5	22	S
0528	SECOND MIXER ASSEMBLY (A12)	Test			0.25			11,12	R
		Test					0.25	22,23	
		Replace			0.1			11,12	
		Repair					0.5	22	S
0529	53 MHz FILTER ASSEMBLY (A43)	Test			0.25			11,12	R
		Test					0.25	22,23	
		Replace			0.1			11,12	
		Repair					0.5	22	S
0530	FIRST MIXER ASSEMBLY (A44, A44A)	Test			0.25			11,12	R
		Test					0.25	22,23	
		Replace			0.1			11,12	
		Repair					0.5	22	S
0531	1 MHz SPECTRUM GENERATOR ASSEMBLY (A45)	Test			0.25			11,12	R
		Test					0.25	22,23	
		Replace			0.1			11,12	
		Repair					0.75	22	S
06	ANTENNA AT-271A/PRC	Inspect	0.1						
		Replace	0.05						
		Repair		0.2				2	U

SECTION III TOOL AND TEST EQUIPMENT REQUIREMENTS
FOR
RADIO SET AN/PRC-77

TOOL OR TEST EQUIPMENT REF CODE	MAINTENANCE CATEGORY	NOMENCLATURE	NATIONAL/NATO STOCK NUMBER	TOOL NUMBER
1	O	MULTIMETER AN/URM-105	6625-00-581-2036	
2	O	TOOL KIT, ELECTRONIC EQUIPMENT TK-101/G	5180-00-064-5178	
3	F	STANDARD ITEMS OF SUPPLY AND ITEMS TO BE FABRICATED BY DIRECT SUPPORT MAINTENANCE SHOPS PER TM 11-5820-667-35		
4	F,H	TEST SET, RF POWER AN/URM-120	6625-00-813-8430	
5	F,H	MULTIMETER TS-352B/U	6625-00-553-0142	
6	F,H,D	SIGNAL GENERATOR AN/URM-103	6625-00-868-8352	
7	F,H,D	VOLTMETER AN/URM-145	6625-00-973-3986	
8	F,H,D	COUNTER, ELECTRONIC AN/USM-207	6625-00-911-6368	
9	F,H,D	MULTIMETER ME-26B/U	6625-00-646-9409	
10	F,H,D	POWER SUPPLY PP-3514/U	6130-00-445-6933	
11	F,H,D	TOOL KIT, ELECTRONIC EQUIPMENT TK-100/G	5180-00-605-0079	
12	F,H,D	TOOL KIT, ELECTRONIC EQUIPMENT TK-105/G	5180-00-610-8177	
13	H	STANDARD ITEMS OF SUPPLY AND ITEMS TO BE FABRICATED BY GENERAL SUPPORT MAINTENANCE SHOPS PER TM 11-5820-667-35		
14	H	CAPACITY METER ZM-3/U	6625-00-229-1060	
15	H,D	SIGNAL GENERATOR AN/URM-127	6625-00-783-5965	
16	H,D	VOLTMETER ME-30E/U	6625-00-420-9354	
17	F,H,D	METER, MODULATION ME-57/U	6625-00-647-3737	
18	F,H,D	ANALYZER, SPECTRUM TS-723B/U	6625-00-668-9418	
19	H,D	OSCILLOSCOPE AN/USM-281A	6625-00-228-2201	
20	D	SIGNAL GENERATOR AN/USM-44	6625-00-669-4031	
21	D	STANDARD ITEMS OF SUPPLY AND ITEMS TO BE FABRICATED BY DEPOT PER TM 11-5820-667-35		
22	D	MODULE TEST FIXTURES FOR DEPOT MODULE REPAIR FACILITY. (FABRICATED BY DEPOT) ALSO, PERIPHERAL TEST EQUIPMENT		
23	D	DEPOT SUPPORT SHOPS AND FACILITIES		
24	O	TEST SET AN/PSM-13 (with ADAPTOR U-297/PSM-13)	6625-00-868-8344	

SECTION IV. REMARKS

REFERENCE CODE	REMARKS
A	OPERATIONAL TESTS
B	CLEAN AND REPLACE BATTERY
C	REPLACEMENT OF ANTENNAS AT-892/PRC-25, AT-271A/PRC, AS-2109/PRC, AND SUPPORT AB-591/PRC-25 (See V below.)
D	REPLACEMENT OF COMPONENT PARTS OF COMPLETE RADIO SET
E	OVERHAUL BY COMPONENTS
F	INCLUDED IN INSPECTION TIME FOR OVERALL RADIO SET
G	REPAIR BY REPLACEMENT OF COMPONENTS
H	QUARTERMASTER REPAIR
I	REPLACED BY OPERATOR; PART IS OBTAINED FROM ORGANIZATION LEVEL
J	CLEAN
K	REPLACEMENT OF MODULES AND SELECTED PARTS
L	OVERHAUL BY ASSEMBLIES, SUBASSEMBLIES, ETC
M	REPLACEMENT OF PRESSURE RELIEF VALVE
N	REPLACEMENT OF KNOBS AND CONNECTOR COVERS
O	REPLACEMENT OF BATTERY CONNECTOR GASKET AND CASE ASSEMBLY
P	REPLACEMENT OF BATTERY CONNECTOR, PILOT LIGHT, OTHER SELECTED PARTS
Q	REPLACEMENT OF CHASSIS-MOUNTED PARTS
R	TEST BY COMPARISON WITH KNOWN OPERABLE RT-841/PRC-77
S	DEPOT REPAIR OF MODULES INCLUDES OVERHAUL
T	REPLACEMENT OF MAJOR ASSEMBLIES INCLUDING SELECTOR MECHANISM
U	REPLACEMENT OF ANTENNA TIP CAP, ANTENNA ASSEMBLY
V	ANTENNA AS-2109/PRC IS ISSUED WITH SOME AN/PRC-77s

APPENDIX E

ADDITIONAL AUTHORIZATION LIST

Section I. INTRODUCTION

1. Scope

This appendix lists additional items you are authorized for the support of Radio Set AN/PRC-77.

2. General

a. This list identifies items that do not have to accompany the AN/PRC-77 and that do not have to be turned in with it. These items are all authorized to you by CTA, MTOE, TDA, or JTA.

b. Battery, Dry BA-4386/U is authorized for use with the AN/PRC-77 in accordance with SB 11-6.

c. Battery, Dry BA-398/U is authorized for arctic (extreme cold) operation. See SB-576 for authorization and other details.

3. Explanation of Listing

National stock numbers, descriptions, and quantities are provided to help you identify and request the additional items you require to support this equipment.

SECTION II. ADDITIONAL AUTHORIZATION LIST

(1) NATIONAL STOCK NUMBER	(2) DESCRIPTION PART NUMBER AND FSCM	USABLE ON CODE	(3) U/M	(4) QTY AUTH
6135-00-926-8322	BATTERY, DRY BA-4386/U (80058)		EA	1
6135-00-926-3503	BATTERY, DRY BA-398/U (80058) (ARCTIC USE)			

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HISA-FM 446-73

APPENDIX F

EXPENDABLE SUPPLIES AND MATERIALS LIST

Section I. INTRODUCTION

1. Scope

This appendix lists expendable supplies and materials you will need to operate and maintain Radio Set AN/PRC-77. These items are authorized to you by CTA 50-970, Expendable Items (Except Medical, Class V, Repair Parts, and Heraldic Items).

2. Explanation of Columns

a. Column 1—Item number. This number is assigned to the entry in the listing and is referenced in the narrative instructions to identify the material (e.g., "Use cleaning compound, item 5, app D").

b. Column 2—Level. This column identifies the lowest level of maintenance that requires the listed item.

C—Operator/Crew

O—Organizational Maintenance

c. Column 3—National Stock Number. This is the National stock number assigned to the item; use it to request or requisition the item.

d. Column 4—Description. Indicates the Federal Item name and, if required, a description to identify the item. The last line for each item indicates the part number followed by the Federal Supply Code for Manufactuer (FSCM) in parentheses, if applicable.

e. Column 5—Unit of Measure (U/M). Indicates the measure used in performing the actual maintenance function. This measure is expressed by a two character alphabetical abbreviation (e.g., ea, in, pr). If the unit of measure differs from the unit of issue, requisition the lowest unit of issue that will satisfy your requirements.

SECTION II EXPENDABLE SUPPLIES AND MATERIALS LIST

(1) ITEM NO.	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) DESCRIPTION PART NO. AND(FSCM)	(5) UNIT OF MEAS
1	C	6810-00-292-9625	TRICHLOROETHANE OT620 (81348)	1 QT
2	O	6850-00-880-7616	SILICONE COMPOUND MIL-S-8660 (81349)	OZ
3	O	9150-00-110-0918	GRAPHITE GREASE, NON-SEIZING COMPOUND (81348) VV6-671	LB
4	O	8040-00-847-6387	EPOXY	OZ

INDEX

	Paragraph	Page
Additional equipment required	1-8	1-5
Antenna:		
Equipment RC-292	6-3	6-3
Homing loop AT-784/PRC	6-4	6-4
Installation:		
AT-271A/PRC	2-6b	2-5
AT-892/PRC	2-6a	2-5
AT-984A/G	6-5	6-6
Preventive maintenance and repair	6-5c	6-8
Use	6-5b	6-6
Antijamming	3-7	3-5
Arctic:		
Conditions, operating procedures	3-8	3-6
Operation using Battery, Dry BA-398/U	6-2	6-4
Assembly and installation for manpack operation	2-5	2-3
Authority, demolition	7-3	7-2
Battery, Dry BA-4386/U:		
Installation	2-4	2-2
Battery, Dry BA-398/U, arctic operation	6-2	6-4
Checking unpacked equipment	2-2	2-1
Cleaning	4-6	4-2
Components	1-6	1-3
Control Group AN/GSA-5	6-9	6-21
Controls, indicators, and connectors, Receiver-Transmitter, Radio RT-841/PRC-77	3-1	3-1
Daily preventive maintenance checks and services chart	4-4	4-2
Demolition:	1-3.1	1-1
Description, general	1-7	1-3
Dimensions, component	2-1b	2-1
Equipment required, additional	1-8	1-6
Forms and records	1-3	1-1
General description	1-7	1-3
Homing operation	6-4	6-4
Indexes, equipment publications	1-2	1-1
Installation:		
Antenna	2-6	2-5
AT-271A/PRC	2-6b	2-5
AT-892/PRC-25	2-6a	2-5
Other	2-6c	2-5
Battery, Dry BA-4386/U	2-4	2-2

	Paragraph	Page
Manpack operation	2-5	2-3
Jamming, recognition and identification	3-6	3-5
Loudspeaker, electromagnetic LS-549/PRC	6-9	6-9
Maintenance service and inspection periods (operator)	4-3	4-1
Maintenance, quarterly (organizational)	5-4	5-1
Minor components	1-7b	1-4
Operating procedures	3-4	3-4
Arctic conditions	3-8	3-5
Operational checklist	4-8	4-3
Operation with TSEC/KY-38	6-19	6-23
Operator's maintenance:		
Scope	4-1	4-1
Service and inspection periods	4-3	4-1
Organizational maintenance:		
Preventive	5-3	5-1
Scope	5-1	5-1
Presetting channels	3-2	3-1
Preventive maintenance:		
Checks and services chart:		
Daily	4-4	4-2
Weekly	4-5	4-2
Organizational	5-5	5-1
Oscillator O-574/GRA	6-8	6-12
Purpose and use	1-4	1-1
Quarterly maintenance:		
Organizational	5-4	5-1
Preventive, checks and services chart	5-5	5-1
Radio Set Control Group AN/GRA-39	6-7	6-10
Receiver-Transmitter Radio RT-841/PRC-77:		
Controls, indicators, and connectors	3-1	3-1
Description	1-7a	1-3
Recognition and identification, jamming	3-6	3-5
Radio Set Control AN/GSA-7	6-8	6-12
Repair	5-7	5-4
Replacement, Battery, Dry BA-4386/U	2-4	2-2
Retransmission Cable Kit MK-456/GRC	6-1	6-1
Scope:		
Manual	1-1	1-1
Operator's maintenance	4-1	4-1
Organizational maintenance	5-1	5-1
Selecting preset channels	3-3	3-4
Siting	2-3	2-2
Stopping procedure	3-5	3-5
Technical characteristics	1-5	1-3
Tools, materials, and test equipment required	5-2	5-1
Troubleshooting	5-6	5-2
TSEC/KY-38, operation	6-8	6-23
Unpacking	2-1	2-1
Visual inspection	4-7	4-2
Weekly pr ventive maintenance checks and services chart	4-5	4-2

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USAAESWBD (5)
USAAVNTBD (5)
USAIB (5)
USACDCEA (1)
USACDCEC (10)
USACDCCBRA (1)
USACDCCEA (1)
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USACDCOA (1)
USACDCQMA (1)
USACDCTA (1)
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LOGCOMD (2)
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USASTRATCOM-EUR (5)
USAESC (70)
MDW (1)
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Eighth USA (5)
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USMA (5)
Svc Colleges (2)
USASCS (5)
USASESCS (5)
USAADS (2)
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USAES (2)
MFSS (5)
USATSCH (5)
USACSS (5)
USAMPS (5)
USASA Tng Cen & Sch (5)
USATC Armor (2)
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USASTC (2)
USAECFB (5)
USAQMCENFL (5)
1st GM Bde (5)
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SAAD (30)
TOAD (14)
LEAD (7)
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NAAD (5)
SVAD (5)
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TEAD (5)
Gen Dep (2)
Sig Sec, Gen Dep (5)
Sig Dep (12)
AMS (1)
APG (5)
DPG (5)
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MAAG (Vietnam) (5)
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1-7
1-37
1-47
1-56
1-59
1-76
1-100
1-101
1-107
1-207
1-257
1-258
1-307
3-267
5-7
5-25
5-26
5-37
5-116
5-129
5-145
5-146
5-155
5-156
5-215
5-217
5-500(AA-AD)(MC)
6-37
6-100
6-101
6-155
6-156
6-175
6-200
6-201
6-216
6-300
6-302
6-315
6-316
6-317
6-319
6-355
6-365
6-401
6-405
6-415
6-416
6-417
6-419
6-425
6-426
6-429
6-435
6-436
6-445
6-449
6-455
6-525
6-536
6-555
6-556
6-557
6-558
6-575
6-576
6-577
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6-617
6-700
6-701
6-705
6-706
6-707
6-725
6-726
7
7-4
7-15
7-18
7-35
7-36
7-37
7-42
7-45
7-55
7-56
7-57
7-58
7-100
8-25
8-26
8-27
9-7
9-22
9-47
9-127
9-377
9-510
11-57
11-95
11-97
11-98
11-99
11-117
11-127
11-155
11-156
11-157
11-158
11-500(AA-AC)
11-587
11-592
11-597
17
17-15
17-16
17-17
17-18
17-27
17-32
17-35
17-42
17-51
17-52
17-55
17-56
17-57
17-58
17-75
17-76
17-77
17-78
17-95
17-98
17-100
17-105
17-127
17-157
19-98
19-500
29-1
29-5
29-11
29-15
29-21
29-25
29-35
29-36
29-41
29-51
29-55
29-56
29-65
29-75
29-79
29-97
29-105
29-109
31-105
32-56
32-57
32-67
32-68
32-77

32-500	44-537	55-407
33-500 (AA-AC)	55-47	57
37	55-89	57-4
37-100	55-99	57-100
39-51	55-117	57-100

NG: State AG (3).

USAR: None.

For explanation of abbreviations used, see AR 320-50.

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