

TECHNICAL MANUAL

**Operator's and Organizational Maintenance
Manual Including Repair Parts and
Special Tools Lists
RADIO SETS AN/URC-80(V)1
AND AN/URC-80(V)3
(NSN 5820-00-097-0082)**

This copy is a reprint which includes current
pages from Changes 1 and 2.

**H E A D Q U A R T E R S, DEPARTMENT OF THE A R M Y
AUGUST 1974**

WARNING

High voltages dangerous to life, exist in the power supply even when power ON/OFF switch is set to OFF. To insure safety, remove power plug before removing cover from the rt unit.

WARNING

High voltages exist in the power supply, even when the power switch is set to the OFF position. To protect against a shock hazard, remove the power cord from the power outlet before removing the cover from the rt unit.

WARNING

High voltage exists in the power supply, even when the power switch is set to the OFF position. Connector 6P2 (fig. FO-1) must be disconnected before strapping is changed or a fuse is replaced.

WARNING

Be sure that the common terminal (pin C) on power connector 6P2 (fig. FO-1) is connected to earth or common ground. This connection grounds the entire radio set and assures adequate safety.

Change

No. 2

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, DC, 15 June 1986

Operator's and Organizational Maintenance Manual

**RADIO SETS AN/URC-80(V)1
AND AN/URC-80(V)3
(NSN 5820-00-097-0082)**

TM 11-5820-820-12, 24 August 1974, is changed as follows:

1. Title of the manual is changed as shown above.
2. Remove old pages and insert new pages as indicated below. New or changed material is indicated by a vertical bar in the margin of the page. Added or revised illustrations are indicated by a vertical bar adjacent to the identification number.

<i>Remove pages</i>	<i>Insert pages</i>
None	A/(B blank)
i and iii and ii
1-1 through 1-4	1-1 through 1-4
1-9 and 1-10	1-9 and 1-10
4-1 and 4-2	4-1 and 4-2
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C-1 through C-4	None

3. File this change sheet in the front of the publication for reference purposes.

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**Operator's and Organizational Maintenance Manual
RADIO SETS AN/URC-80(V)1
AND AN/URC-80(V)3
(NSN 5820-00-097-0082)**

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter or DA Form 2028 (Recommended Changes to Publications and Blank Forms) directly to: Commander, US Army Communications Electronics Command and Fort Monmouth, ATTN: AMSEL-ME-MP, Fort Monmouth, NJ 07703-5007. A reply will be furnished to you.

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CHAPTER 1

INTRODUCTION

Section I. GENERAL

1-1. Scope.

This manual describes Radio Set AN/URC-80(V)1/3 (fig. 1-1), and procedures associated with operator/crew and organizational maintenance.

1-2. Consolidated Index of Army Publications and Blank Forms.

Refer to the latest issue of DA Pam 310-1 to determine whether there are any new editions, changes, or additional publications pertaining to the equipment.

1-3. Reporting Equipment Improvement Recommendations (EIR).

If your AN/URC-80(V)1/3 Radio Set needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about the design. Put it on an SF 368 (Quality Deficiency Report). Mail it to: Commander, US Army Communications-Electronics Command and Fort Monmouth, ATTN: AMSEL-PA-MA-D, Fort Monmouth, New Jersey 07703-5023. We'll send you a reply.

1-4. Maintenance Forms, Records, and Reports.

a. Reports of Maintenance and Unsatisfactory Equipment. Department of the Army forms and procedures used with equipment maintenance will be

those prescribed in DA Pam 738-750 as contained in the Maintenance Management Update.

b. Report of Packaging and Handling Deficiencies. Fill out and forward SF 364 (Report of Discrepancy (ROD)) as prescribed by AR 735-11-2/DLAR 4140.55/NAVMA'TINST 4355.73A/AFR 400-54/MCO 4430.3H.

c. Discrepancy in Shipment Report (DISREP) (SF 361). Fill out and forward Discrepancy in Shipment Report (DISREP) (SF 361) as prescribed in AR 55-38/NAVSUPINST 4610.33C/AFR 75-181/MCO P4610.19D/DLAR 4500.15.

1-5. Destruction of Army Electronics Materiel.

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

1-5.1. Administrative Storage.

Administrative storage of equipment issued to and used by Army activities will have preventive maintenance performed in accordance with the PMCS chart before storing. When removing the equipment from administrative storage, the PMCS should be performed, to assure operational readiness. Disassembly and repacking of equipment for shipment or limited storage are covered in TM 740-90-1.

Section II. DESCRIPTION AND DATA

1-6. Purpose and Use

Radio Set AN/URC-80(V)1/3 is a very high frequency-frequency modulated (vhf-fm) transceiver that provides reliable short-range (35 to 40 miles) voice communications on all channels of the maritime service band. Transmit and receive operation is available on 55 channels between 156.050 and 162.000 MHz. In addition, the maritime weather channel can be monitored on 162.550 MHz. The radio set is used on ships, boats, and miscellaneous fixed and mobile shore stations licensed to operate in the maritime vhf band.

1-7. Description

Radio Set AN/URC-80(V)1/3 (radio set) (fig. 1-1) NSN 5995-00-099-5841 consists of six units: Unit 1, Cable Assembly Kit; Unit 2, Receiver-Transmitter Control C-8981/URC-80(V); Unit 3, Handset H-189/GR; Unit 4, Loudspeaker LS-610/UR (for main receiver); Unit 5, Loudspeaker LS-610/UR (for auxiliary receiver); and Unit 6, Radio Receiver-Transmitter RT-1061/URC-80(V). The units are described in the following paragraphs.

a. Cable Assembly Kit. The cable assembly kit (fig. 1-2 and table 1-1) contains control cable 1W1, and the connectors, sleeving, and terminal lug required to connect units of the radio set.

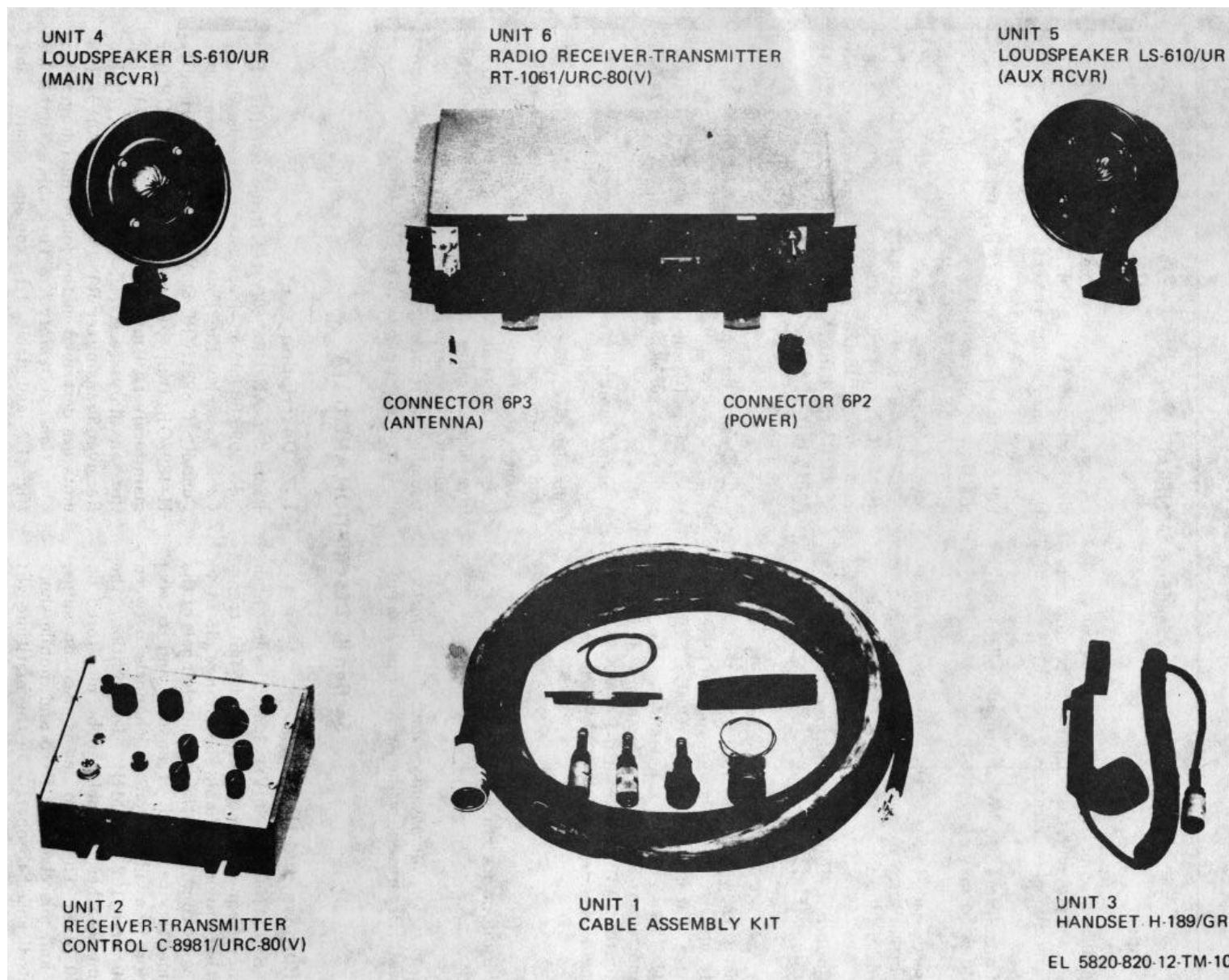


Figure 1-1. Radio Set AN/URC-80(V)1/3

Control cable 1W1 connects Receiver-Transmitter Control C-8981/URC-80(V) to Radio Receiver Transmitter RT-1061/URC-80(V). This cable is equipped with one connector 1W1P2 (MS3107A28-21P, CPN 372-5942-040) that mates with jack J1-CONTROL on the control unit. The connector for the other end of the control cable 1P1 (PT06A18-32PSR, CPN 371-6246-000) is furnished separately in the cable assembly kit and is assembled on control cable 1W1 when the radio set is installed. This arrangement permits the control cable to be cut to the exact length required for a particular installation. Two U-229/U connectors (CPN 369-0104-000) are supplied to connect the two loudspeakers. These connectors mate with jacks J3-MAIN and J4-AUX on the control unit. A U-77/U connector (CPN 369-1016-000) is also included in the

cable assembly kit but is not used in the AN/URC-80(V)1/3 configuration. This connector mates with jack J2-ICS on the control unit and may be used to connect the radio set to compatible telephone or intercom equipment.

b. *Receiver Transmitter Control C-8981 /URC-80[V].* Receiver-Transmitter Control C-8981,/URC-80(V) (control unit) (figure 1-3) is a waterproof control unit that interfaces all the units of Radio Set AN/URC-80(V)1/3. All the controls and indicators required to operate the radio set except the power ON-OFF switch are located on the front of the control unit.

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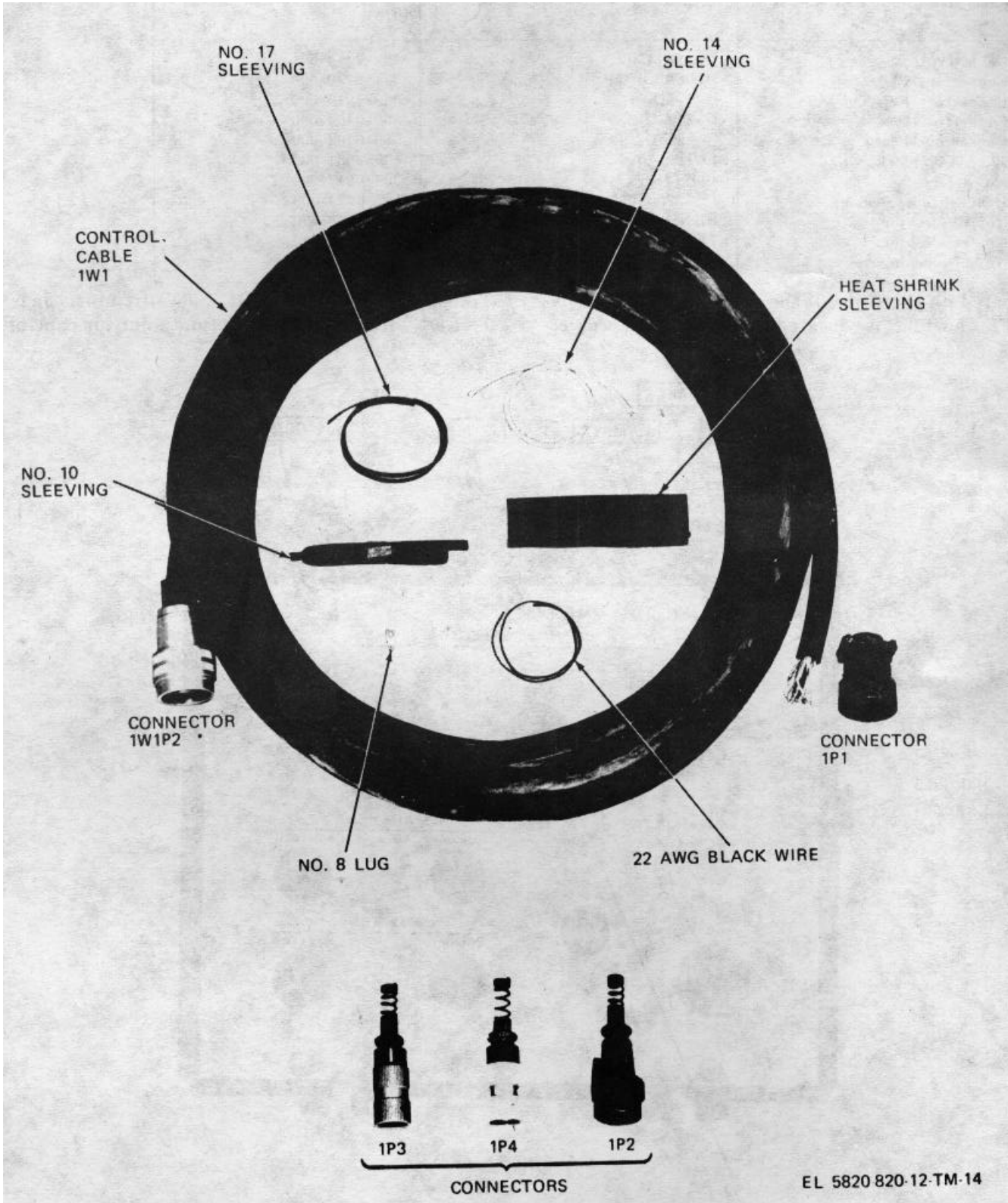


Figure 1-2. Cable assembly kit.

Table 1-1. Cable assembly kit

Item	Manufactory or MIL part no.	Collins Radio part no. (CPN)
Cable 1W1	782-9314-001	782-9314-001
Connector 1P1	PTO06A18-32PSR	371-6246-000
Connector 1P2	U-77/U	369-1016-000
Connector 1P3	U-229/U	369-0104-000
Connector 1P4	U-229/U	369-0104-000
22 AWG black wire	1XT22730-0	439-4031-000
No. 8 lug	4007-8HT	304-0017-000
Heat shrink sleeving	152-3973-000	152-3973-000
No. 10 sleeving	BENHAR1151-10-2	152-2745-000
No. 14 sleeving	TEFTW14A	152-2553-000
No. 17 sleeving	MIL13190CLBA1SIZE17	152-1353-000

The ON-OFF switch is located on Radio Receiver Transmitter RT-1061/URC-80(V) (rt unit). Jack J1-CONTROL is the connection point for control cable 1W1 that connects the rt unit to the control unit.

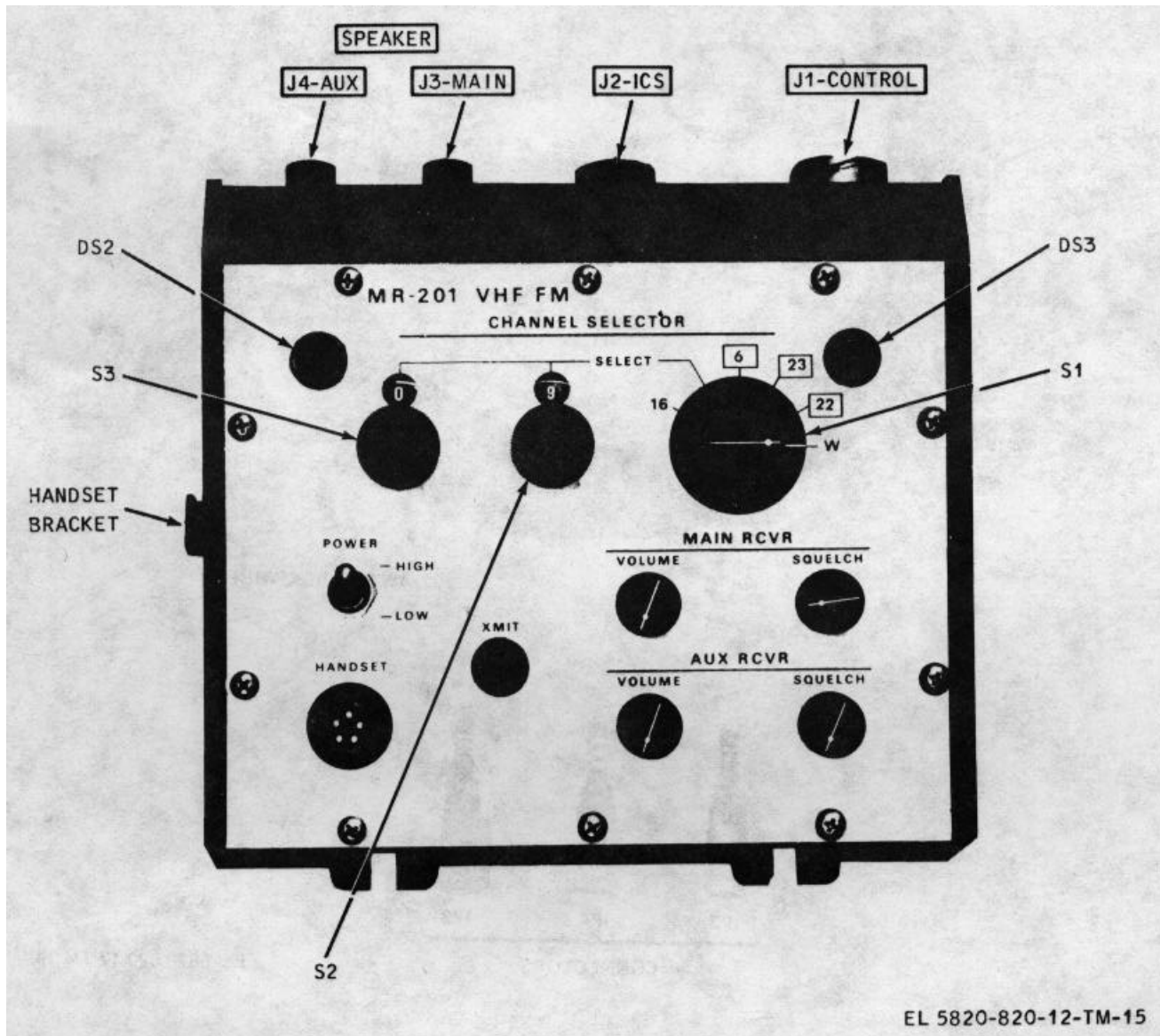


Figure 1-3. Receiver-Transmitter Control C-8981. URC-80[V].

Two loudspeaker LS-610/UR units connect to jacks J3-MAIN and J4-AUX. Jack J2-ICS is not used in the AN/URC-80(V)1/3 configurations. Jack J2-ICS is used when the radio set is interfaced with telephone or intercom equipment. The HANDSET jack is located on the front panel and is the connector for Handset H-189/GR. The control unit also contains interconnect wiring, a printed circuit card, and two audio transformers. The printed circuit card has circuits for a microphone amplifier, impedance matching networks for interface with 600-ohm telephone lines, and an amplifier for the audio output of the auxiliary receiver. Both of the loudspeakers are supplied 5-watt levels by the audio transformers.

c. *Handset H-189/GR.* Handset H-189/GR (handset) (figure 1-4) is a lightweight, waterproof unit with a 24-inch retractable cord that will extend to over 6 feet. The cord is terminated in a 5-pin connector type U-229/U. Refer to TM 11-5965-280-15 for a complete description of this unit.

d. *Loudspeaker LS-610/UR.* Two Loudspeakers LS-610/UR (loudspeaker) (figure 1-5) provide separate audio outputs for the main and auxiliary receivers. These loudspeakers are approximately 6 inches in diameter and are waterproof, blastproof, and submergence proof up to a depth of 15 feet. The

speaker is rated at 25 watts and has a 16-ohm impedance. A serrated swivel mounting bracket allows the loudspeaker to be swiveled through an angle of 90° vertically.

e. *Radio Receiver-Transmitter RT-1061/URC-80[V].* Radio Receiver Transmitter RT-1061/URC-80(V) (rt unit) (figure 1-6) is contained in a splashproof metallic case with a latch-on cover. The ends of the case are made of cast-aluminum heat-sink sections that dissipate heat from power amplifier module 6A1 and power supply module 6A7 (figure 1-6). Wired chassis 6A8 (figure 1-7) contains the interconnect wiring and backplane A8A1 that has receptacles for the plug-in circuit cards. Card guides in the wired chassis secure the circuit cards in place. Figure 1-6 shows the location of the following plug-in circuit cards and modules that comprise the rt unit.

- (1) Power amplifier module 6A1 (figure 1-8)
- (2) Temperature-compensated crystal oscillator (TCXO)/multiplier card A2 (figure 1-9)
- (3) Mixer/variable divider card 6A3 (figure 1-10)

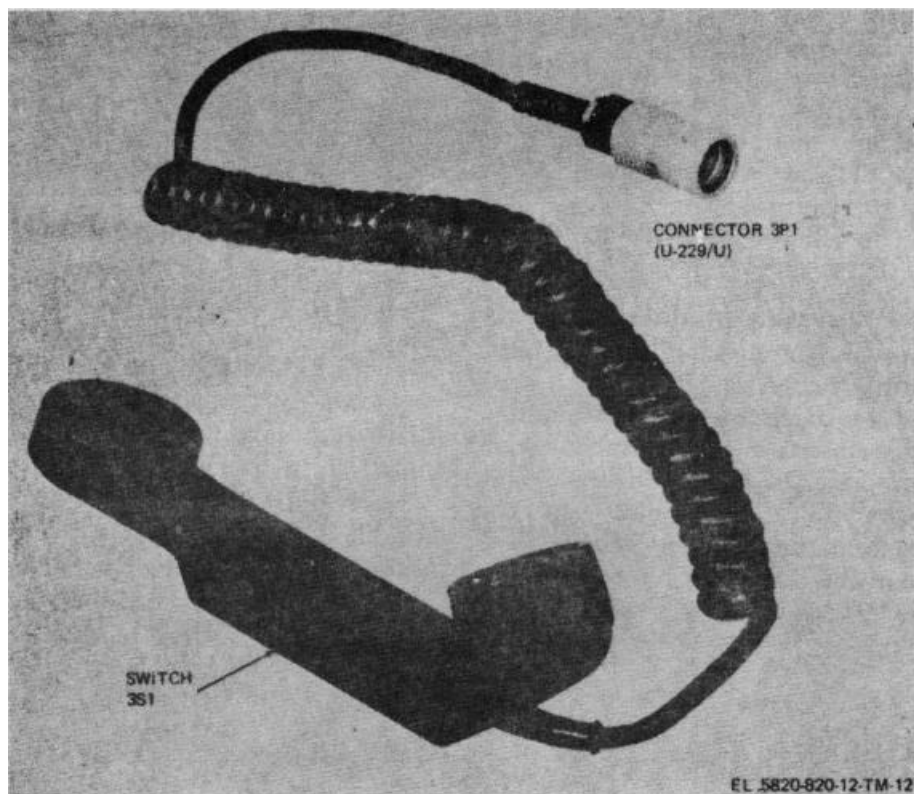


Figure 1-4. Handset H-189/GR.

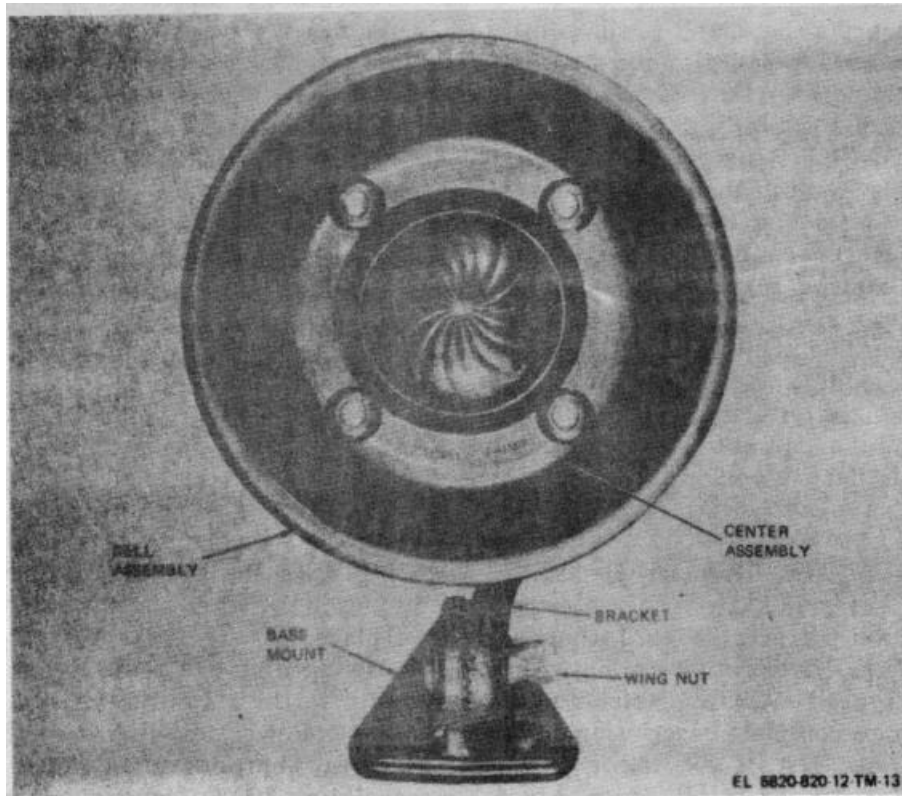


Figure 1-5. Loudspeaker LS-610/UR.

- (4) Modulator and voltage-controlled oscillator (VCO) card 6A4 (figure 1-11)
- (5) Audio/squelch card 6A5 (figure 1-12)
- (6) Receiver card 6A6 and 6A9 (figure 1-13)
- (7) Power supply module 6A7 that includes inverter card A7A1 and regulator card A7A2 (figures 1-14, 1-15, and 1-16)
- (8) Injection oscillator card 6A10 (figure 1-17)

1-8. Difference between Models

a. There are several models of the AN/URC -80(V) but only the AN/URC-80(V)1 and AN/URC-80(V)3 are described in this manual. The major difference between the two models is in the units that comprise the two radio sets. Table 1-2 identifies the units that make up the AN/URC-80(V)1 and the AN/URC-80(V)3.

b. Differences in the rt units are in the number of circuit cards used. For example, an RT-1061/URC-80(V) is converted to an RT-1060/URC-80(V) by removing connector 6P1 (figure 1-6) and installing auxiliary receiver card 6A9 and injection oscillator card 6A10 in the positions shown in figure 1-6. Table 1-3 lists the major subassemblies that comprise the two rt units. Auxiliary receiver card 6A9 is identical to main receiver card 6A6 (figure 1-13) except that it receives its injection signal from injection oscillator card 6A10 instead of TCXO/multiplier card 6A2. The output frequency of the auxiliary receiver is determined by the frequency of the crystals installed on injection oscillator card 6A10. In the AN/URC-80(V)1, the auxiliary receiver frequency is 156.650 MHz (channel 13, table 3-2). The AN/URC-80(V)3 does not have the auxiliary receiver capacity.

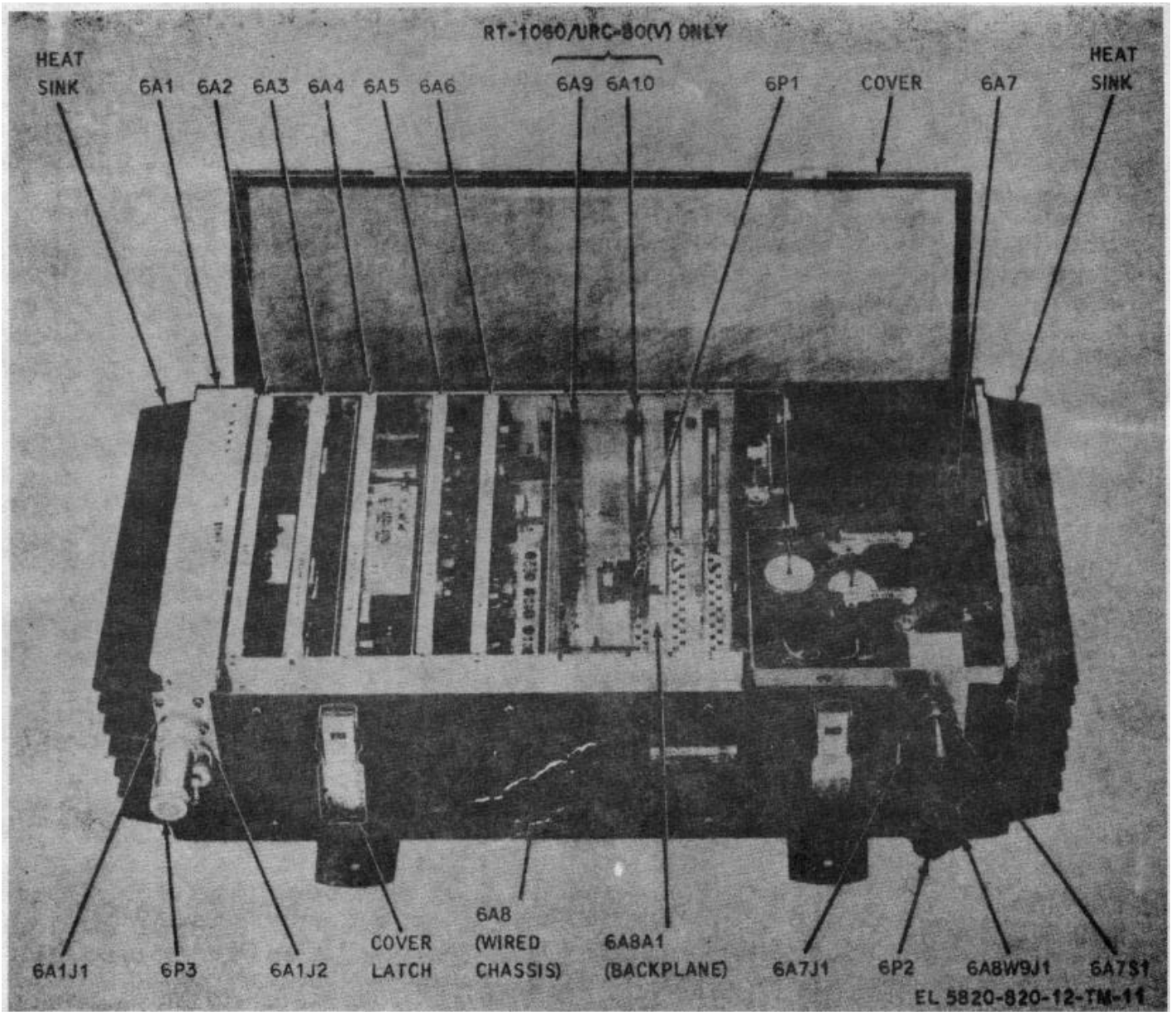


Figure 1-6. Radio Receiver-Transmitter RT-1061/URC-80[V]/RT-1060/URC-80[V].

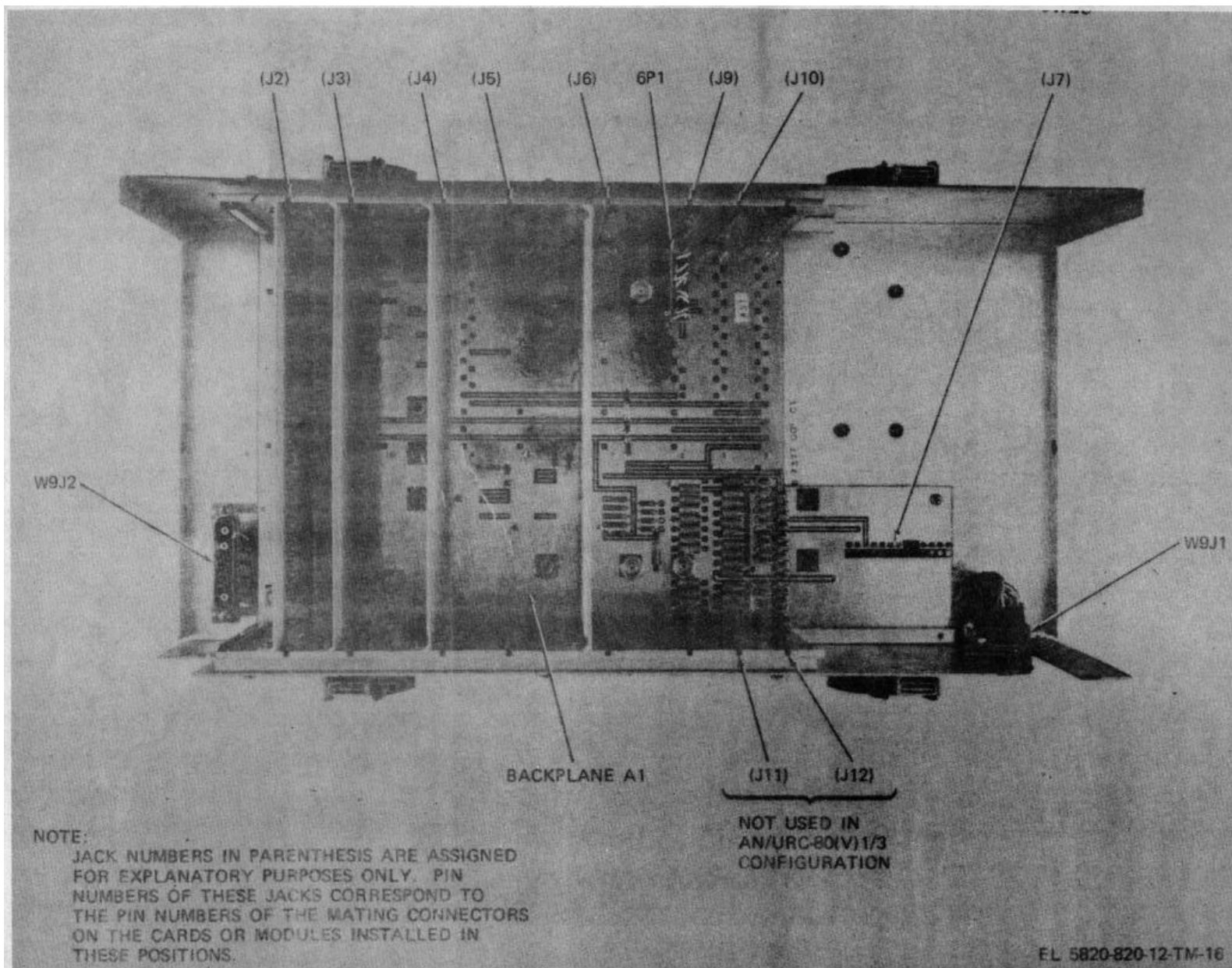


Figure 1-7. Wired chassis 6A8.

Table 1-2. Difference between models of radio set

Radio set or unit	Collins Radio part no. (CPN)	included in	
		AN/URC-80(V)1	AN/URC-80(V)3
Radio Set AN/URC-80(V)1	792-6527-001	NA	NA
Radio Set AN/URC-80(V)3	792-6527-003	NA	NA
Unit 1: Cable Assembly Kit	610-1976-001	yes	yes
Unit 2: Receiver Transmitter Control C-8981 /URC-80(V)	792-6532-001	yes	yes
Unit 3: Handset H-189/GR	792-6534-001	yes	yes
Unit 4: Loudspeaker LS-610/UR	792-6528-001	yes	yes
Unit 5: Loudspeaker LS-610/UR	792-6528-001	yes	yes
Unit 6: Radio Receiver-Transmitter RT-1060/URC-80(V)	792-6529-003	yes	no
Unit 6: Radio Receiver-Transmitter RT-1061 /URC-80(V)	758-5153-002	no	yes

Table 1-3. Difference between models of rt unit

Unit or subassembly	Collins Radio part no. (CPN)	Included in	
		Rt-1060/URC-80(V)	Rt-1061/URC-80(V)
Radio Receiver-Transmitter RT-1060/URC-80(V)	792-6529-003	NA	NA
Radio Receiver-Transmitter RT-1061/URC-80(V)	758-5153-002	NA	NA
Power amplifier module 6A1	796-7403-002	yes	yes
TCXO/multiplier card 6A2	793-9314-001	yes	yes
Mixer/variable divider card 6A3	793-9388-002	yes	yes
Modulator/VCO card 6A4	793-9307-001	yes	yes
Audio/squelch card 6A5	793-9295-001	yes	yes
Receiver card 6A6	793-9325-004	yes	yes

Table 1-3. Difference between models of rt unit (Cont)

Unit or subassembly	Collins Radio part no. (CPN)	Included in	
		RT- 1060/ URC-80(V)	RT-1061/ URC-80(V)
Power supply module 6A7	610-1809-001	yes	yes
Wired chassis 6A8	796-7405-002	yes	yes
Auxiliary receiver card 6A9	793-9325-004	yes	no
Injection oscillator card 6A10	793-9382-002	yes	no
Connector 6P1	782-9342-001	no	yes

1-9. tabulated Data.

a. Technical Characteristics

Channel capacity:	See table 3-2																
Power consumption:	100 W maximum																
Power input:	Either 120 or 240 Vac $\pm 15\%$, 50 to 400 Hz, single phase, or 12, 24, or 32 Vdc																
Power supply outputs:	<table> <thead> <tr> <th>Vdc</th> <th>Amperes</th> <th>Regulation</th> <th>Ripple</th> </tr> </thead> <tbody> <tr> <td>+21</td> <td>3.8</td> <td>$\pm 5\%$</td> <td>50 m V</td> </tr> <tr> <td>+12</td> <td>0.5</td> <td>$\pm 2\%$</td> <td>10 m V</td> </tr> <tr> <td>+5</td> <td>1.0</td> <td>$\pm 2\%$</td> <td>10 m V</td> </tr> </tbody> </table>	Vdc	Amperes	Regulation	Ripple	+21	3.8	$\pm 5\%$	50 m V	+12	0.5	$\pm 2\%$	10 m V	+5	1.0	$\pm 2\%$	10 m V
Vdc	Amperes	Regulation	Ripple														
+21	3.8	$\pm 5\%$	50 m V														
+12	0.5	$\pm 2\%$	10 m V														
+5	1.0	$\pm 2\%$	10 m V														
Operating temperature:	-35° C to +55° C (-31° F to + 131° F)																
Storage temperature:	-55° C to +85° C (-67°F to +185°F)																
Humidity:	90% at 50° C for a period of 8 hours (operating) Per MIL-STD-167																
Vibration:	<table> <thead> <tr> <th>Frequency</th> <th>Amplitude</th> </tr> </thead> <tbody> <tr> <td>50 to 15 Hz</td> <td>0.06 inch</td> </tr> <tr> <td>16 to 25 Hz</td> <td>0.04 inch</td> </tr> <tr> <td>26 to 33 Hz</td> <td>0.02 inch</td> </tr> </tbody> </table>	Frequency	Amplitude	50 to 15 Hz	0.06 inch	16 to 25 Hz	0.04 inch	26 to 33 Hz	0.02 inch								
Frequency	Amplitude																
50 to 15 Hz	0.06 inch																
16 to 25 Hz	0.04 inch																
26 to 33 Hz	0.02 inch																
Shock:	Per MIL-T-5422, 18 impact shocks of 15 g's, 3 shocks in each direction of each plane (nonoperating)																
<i>Transmitter:</i>																	
Power output	22.5 (+1.0, -0.2) watts at 156.025 MHz to 157.425 MHz (Low power output; switchable to 0.75 \pm 0.25 watt)																
Output impedance	50 ohms, 2:1 vswr (safe into an infinite vswr for 1 minute)																
Frequency stability	$\pm 0.0005\%$																
Modulation	Frequency modulation (+5 kHz deviation)																
Spurious and harmonics	More than 85 dB below carrier																
Audio distortion	Less than 5% at 1000 Hz and 2/3 system deviation																
Audio response	Preemphasis within +1, -3 dB of standard 6 dB/octave curve (from 300 to 2500 Hz)																
<i>Receiver:</i>																	
Frequency	156.025 MHz to 162.550 MHz with 25-kHz channel spacing																
Sensitivity	0.5 μ V for 20-dB quieting																
Selectivity	-80 dB																
Spurious response	100 dB																
Image rejection	-80 dB																
Audio output	5 watts at less than 5% distortion																
Squelch	Carrier/noise squelch (0.25 μ V sensitivity)																
If. frequencies	24.5 MHz using high side injection, 0.5 MHz using low side injection																
Input impedance	50 ohms																
Audio response	Deemphasis, within +1, -8 dB of standard 6 dB/octave curve																

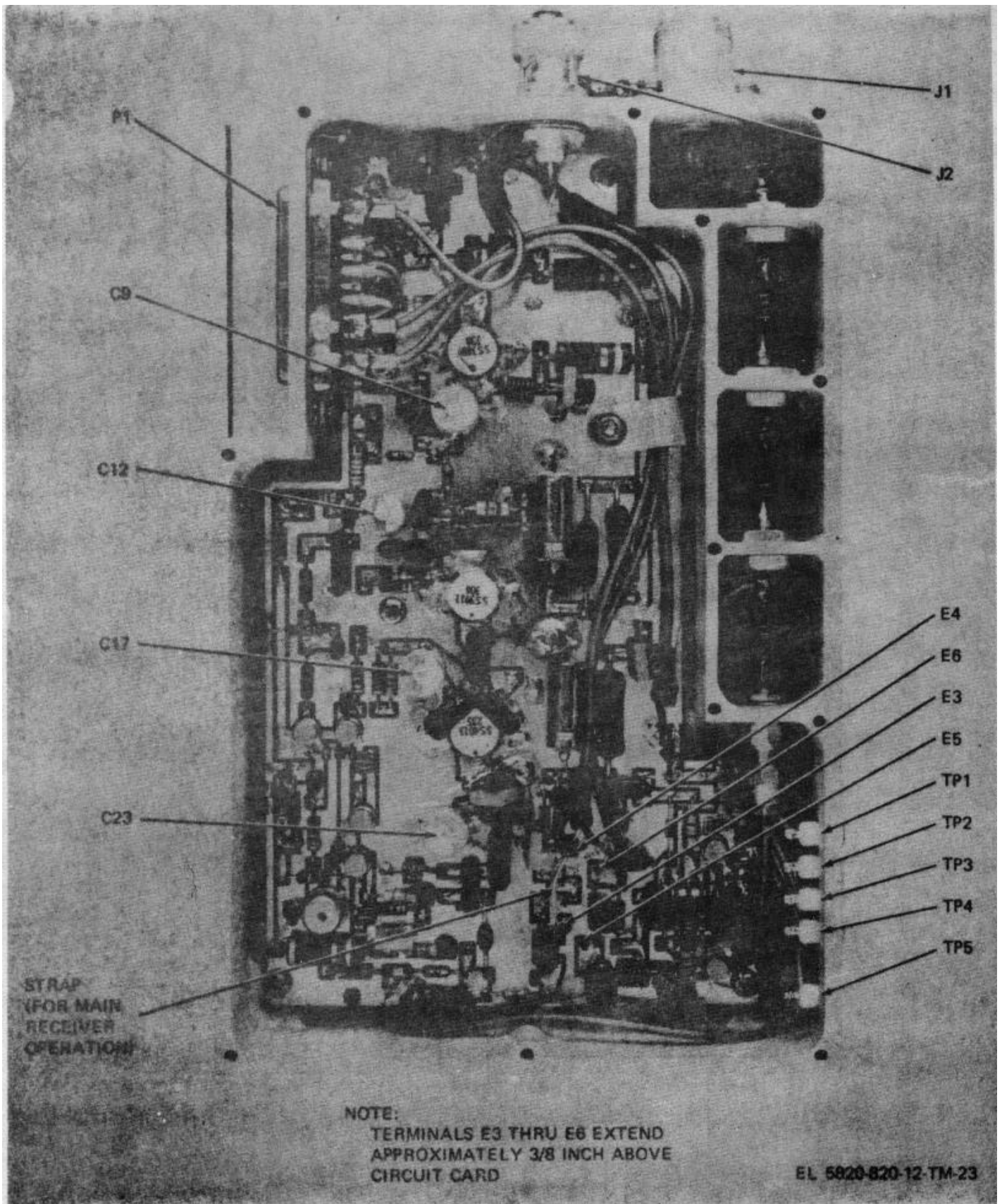


Figure 1-8. Power amplifier module 6A1, cover removed.

b. Items Comprising an Operable Equipment.

FSN	Item	Quantity	Height (in)	Depth (in)	Width (in)	Weight (lb)
	Radio Set AN/URC-80(V)1/3 consisting of:					
	Cable Assembly Kit	1		(cable 25 feet long)		6.750
	Receiver-Transmitter Control C-8981/URC-80(V)	1	8.43	4.30	8.56	6.625
	Handset H-189/GR	1	8.0	0.875	1.563	5.187
	Loudspeaker LS-610/UR	2	9.0	5.0	6.0	5.25
	Radio Receiver-Transmitter RT-1061/URC-80(V)	1	5.125	8.5	18	24.625
	Auxiliary Receiver Card	1	4.375	1.125	6.875	1.75
		1	4.375	0.750	6.875	0.50

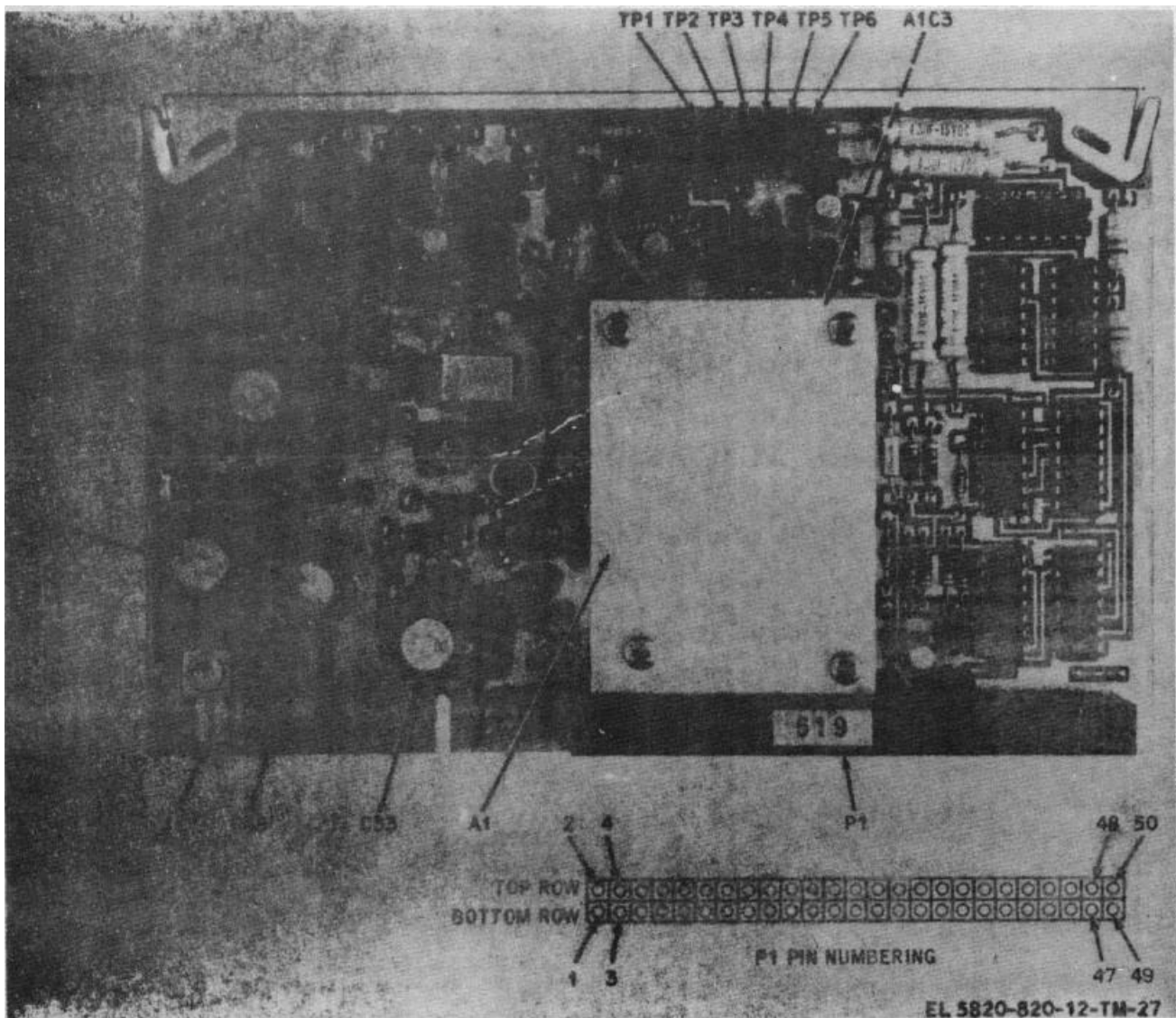


Figure 1-9. TCXO/multiplier card 6A2.

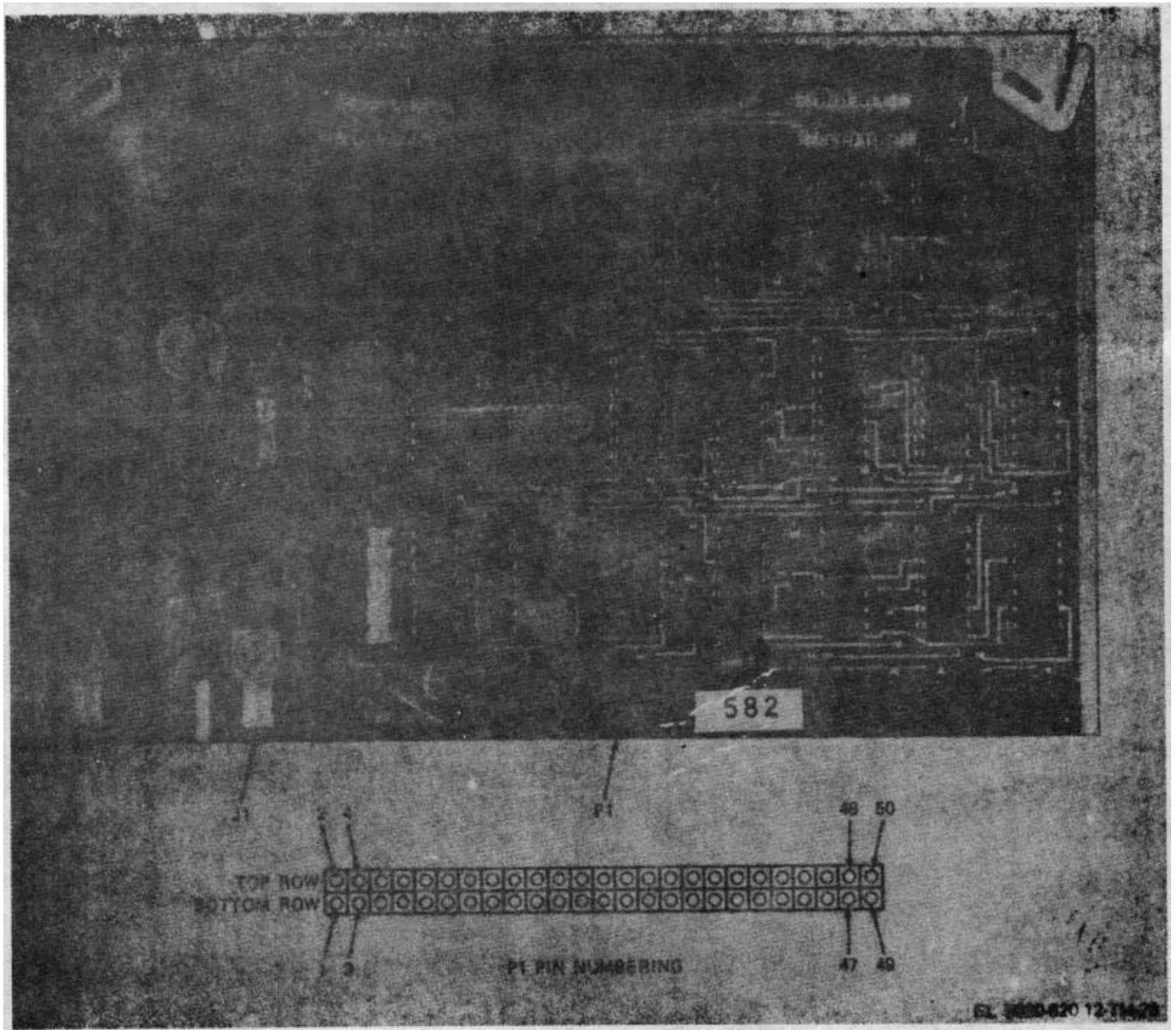


Figure 1-10. Mixer/variable divider card 6A3.

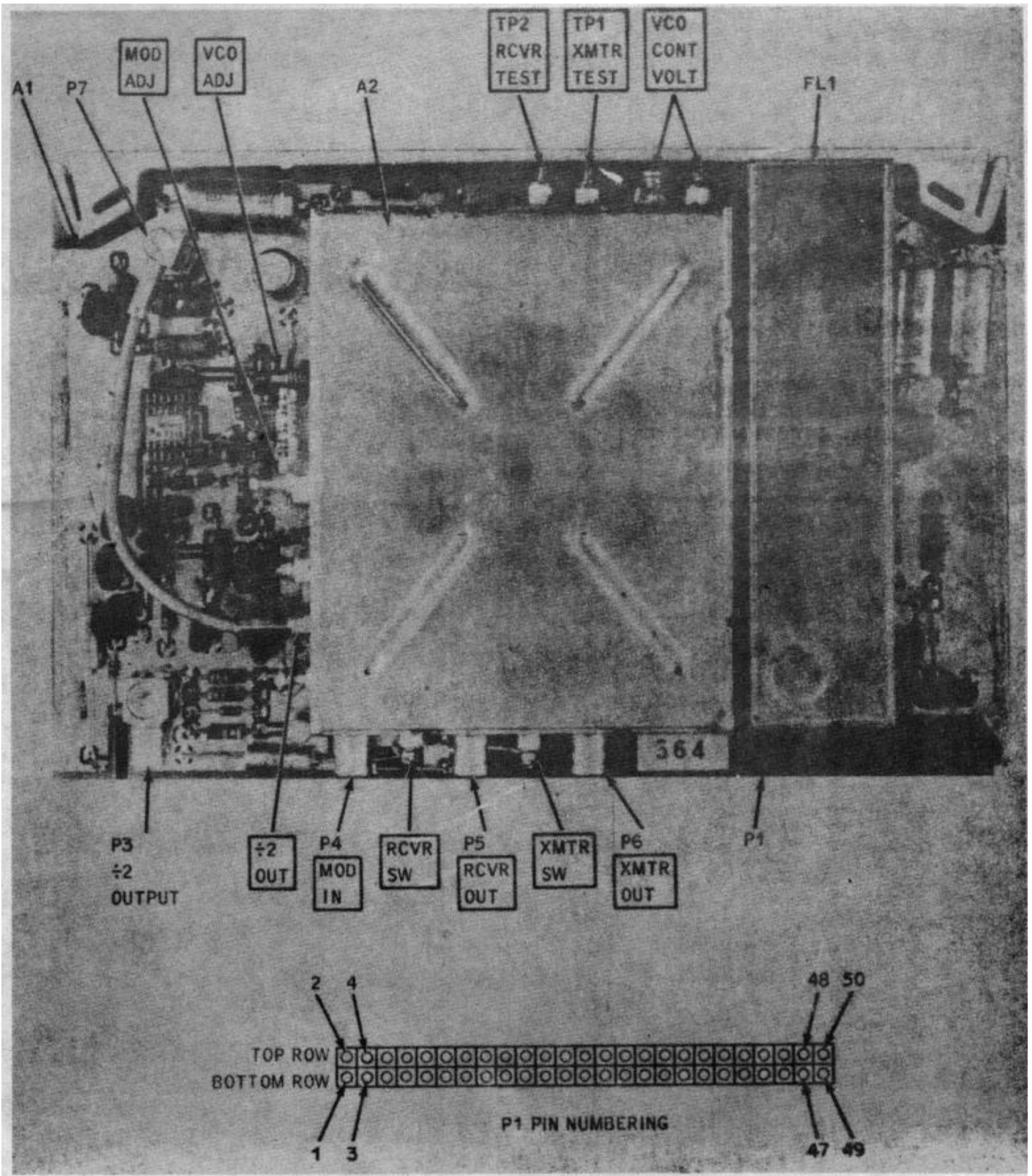


Figure 1-11. Modulator/VCO card 6A4.

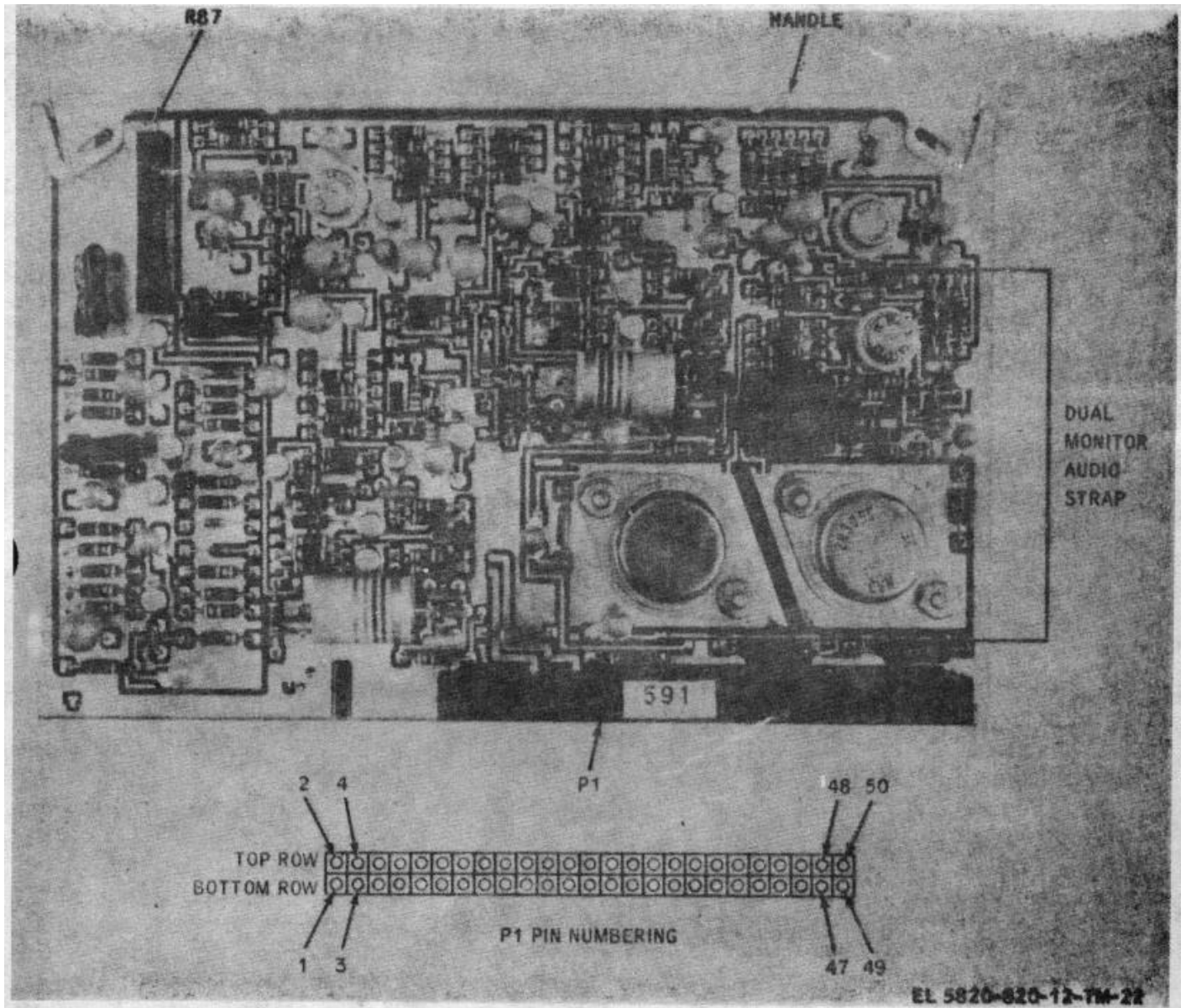


Figure 1-12. Audio/squelch card 6A5.

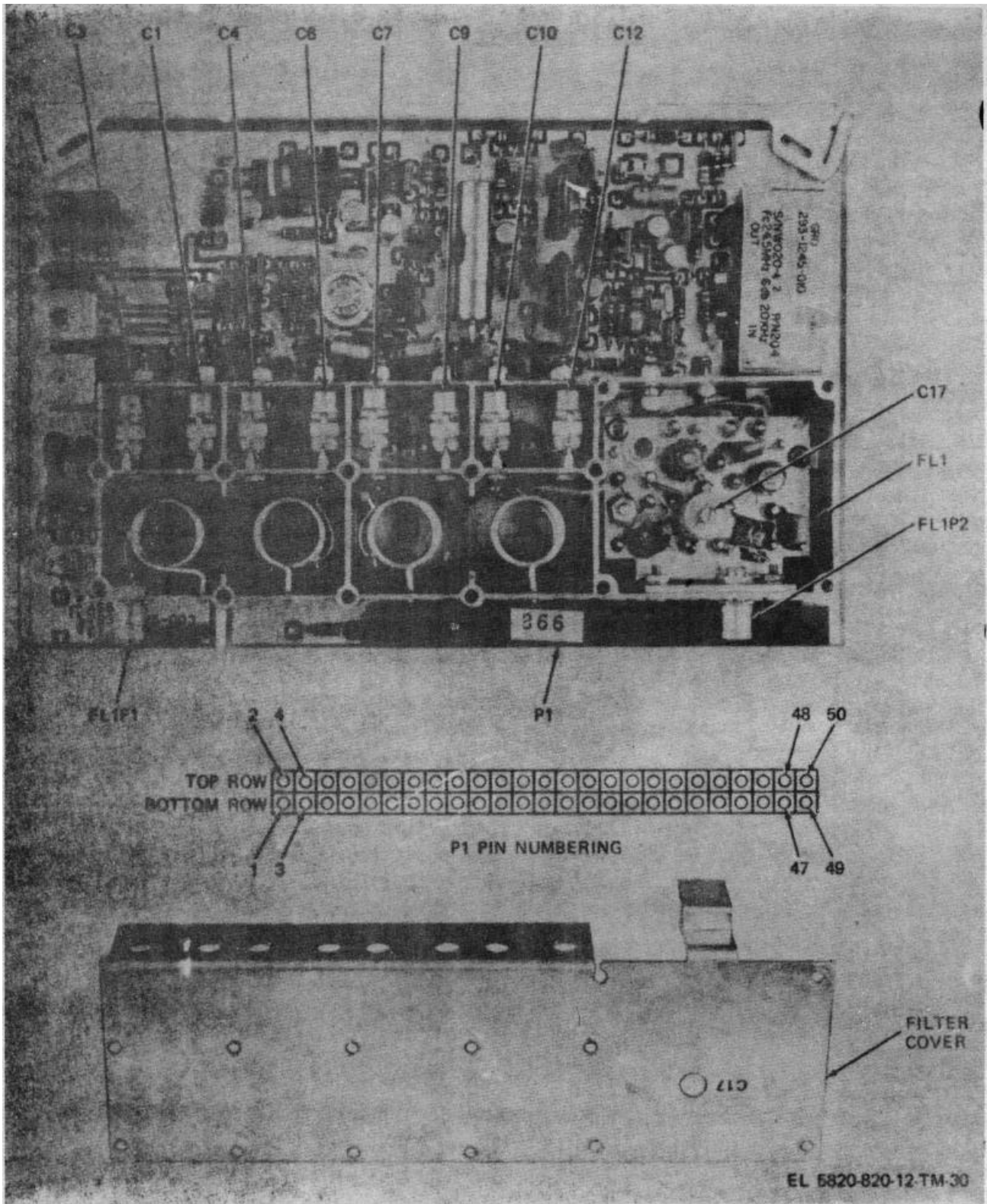


Figure 1-13. Receiver card 6A6 and 6A9.

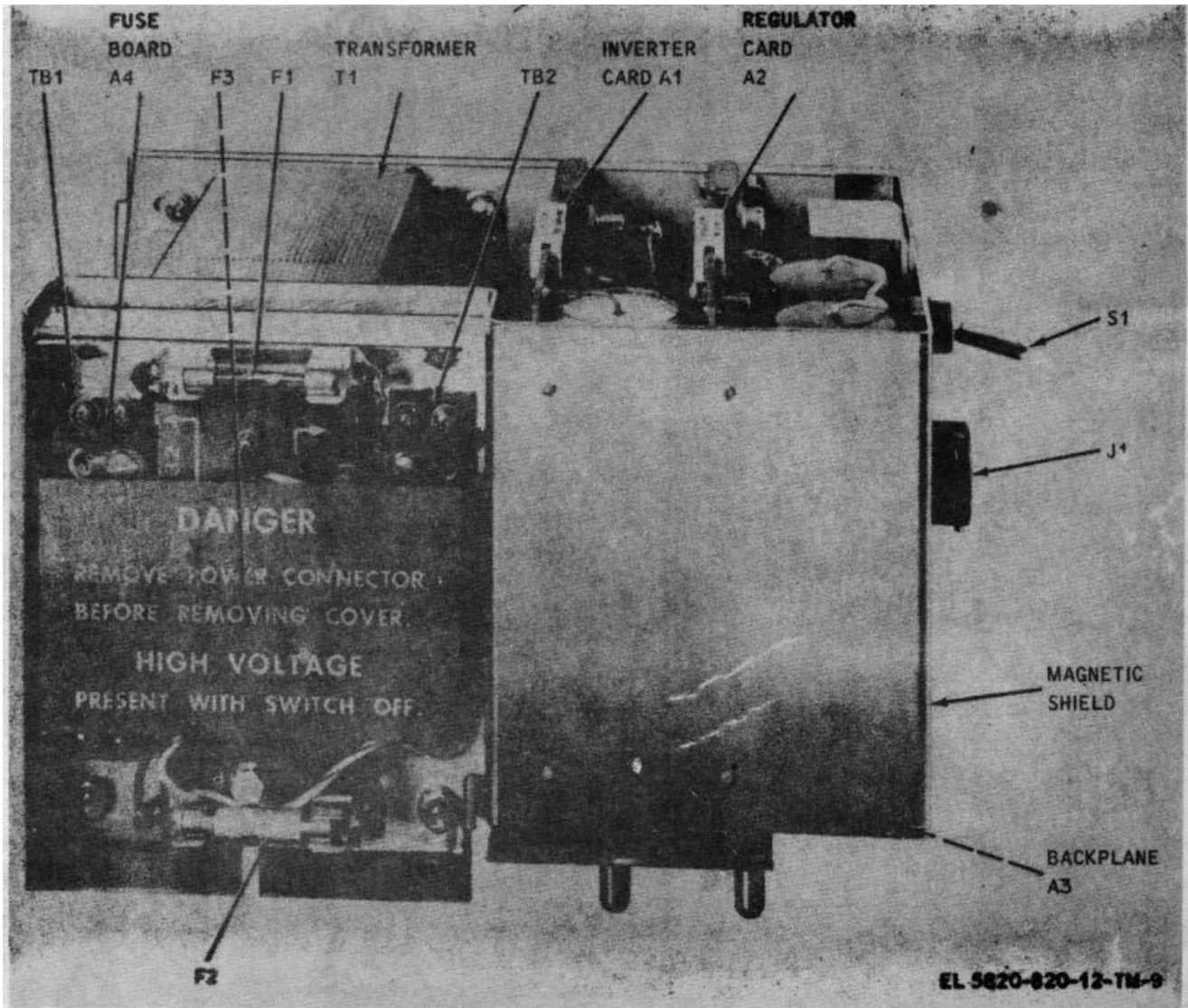


Figure 1-14. Power supply module 6A7.

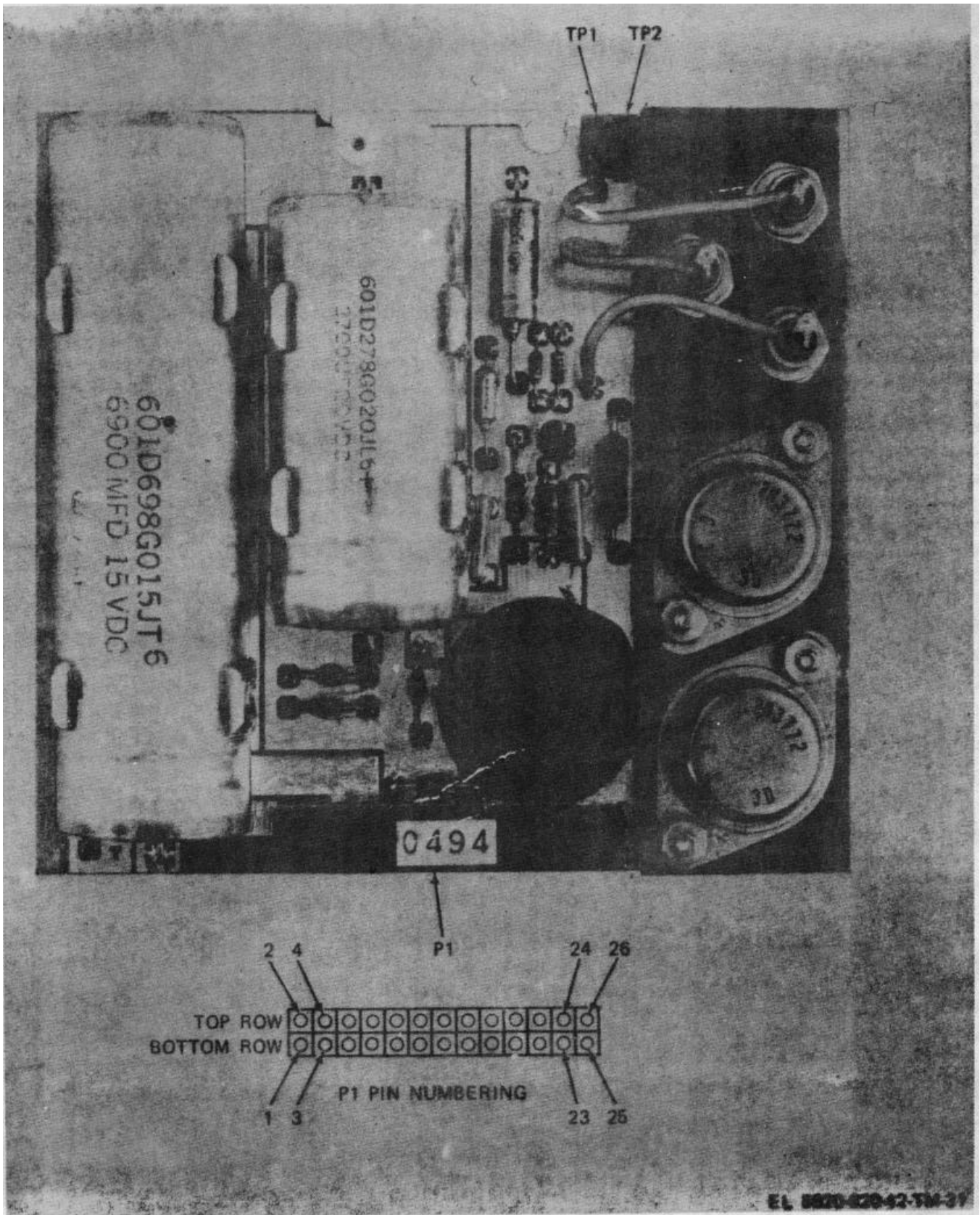


Figure 1-15. Inverter card 6A7A1

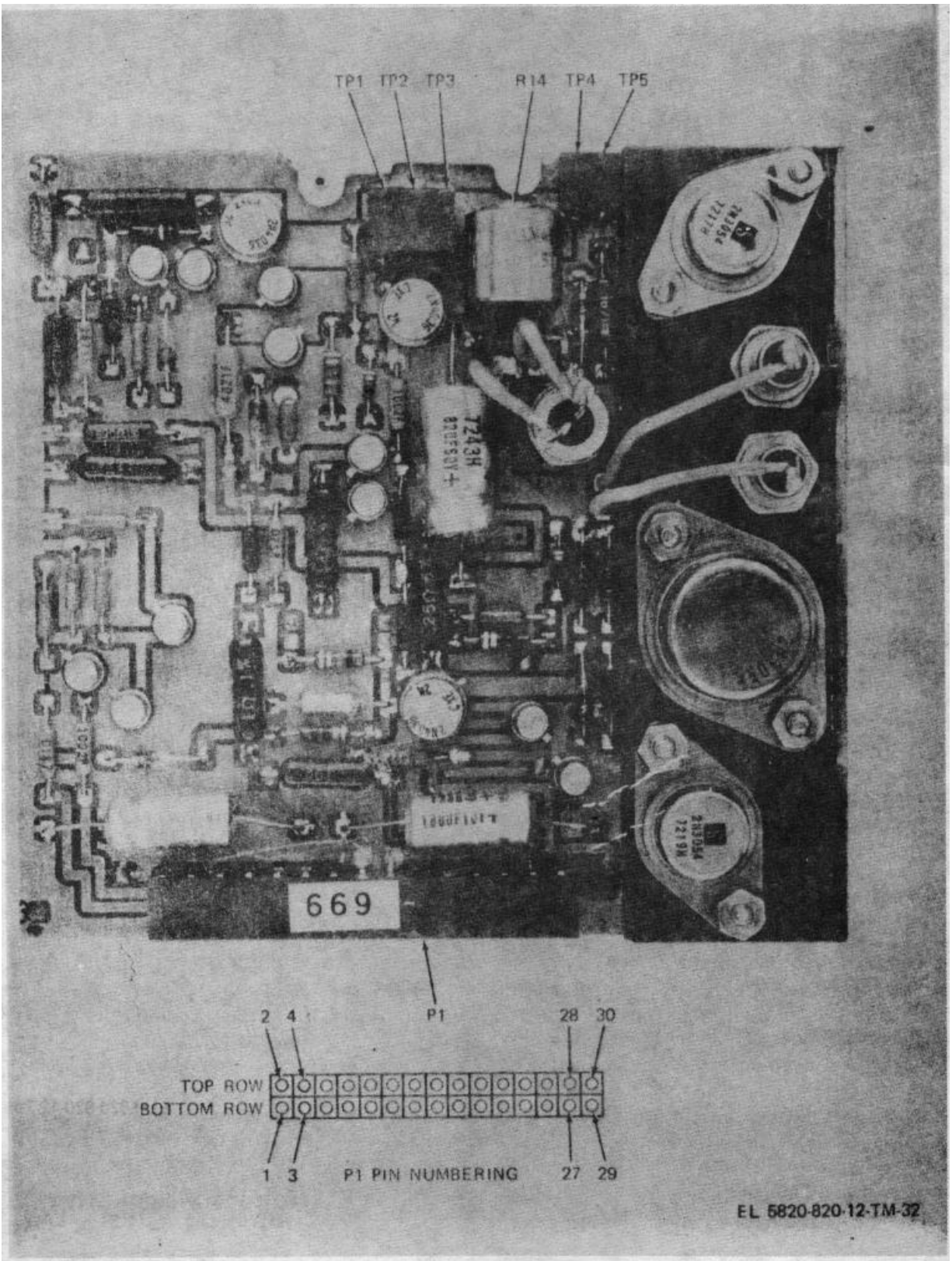


Figure 1-16. Regulator card 6A7A2
1-19

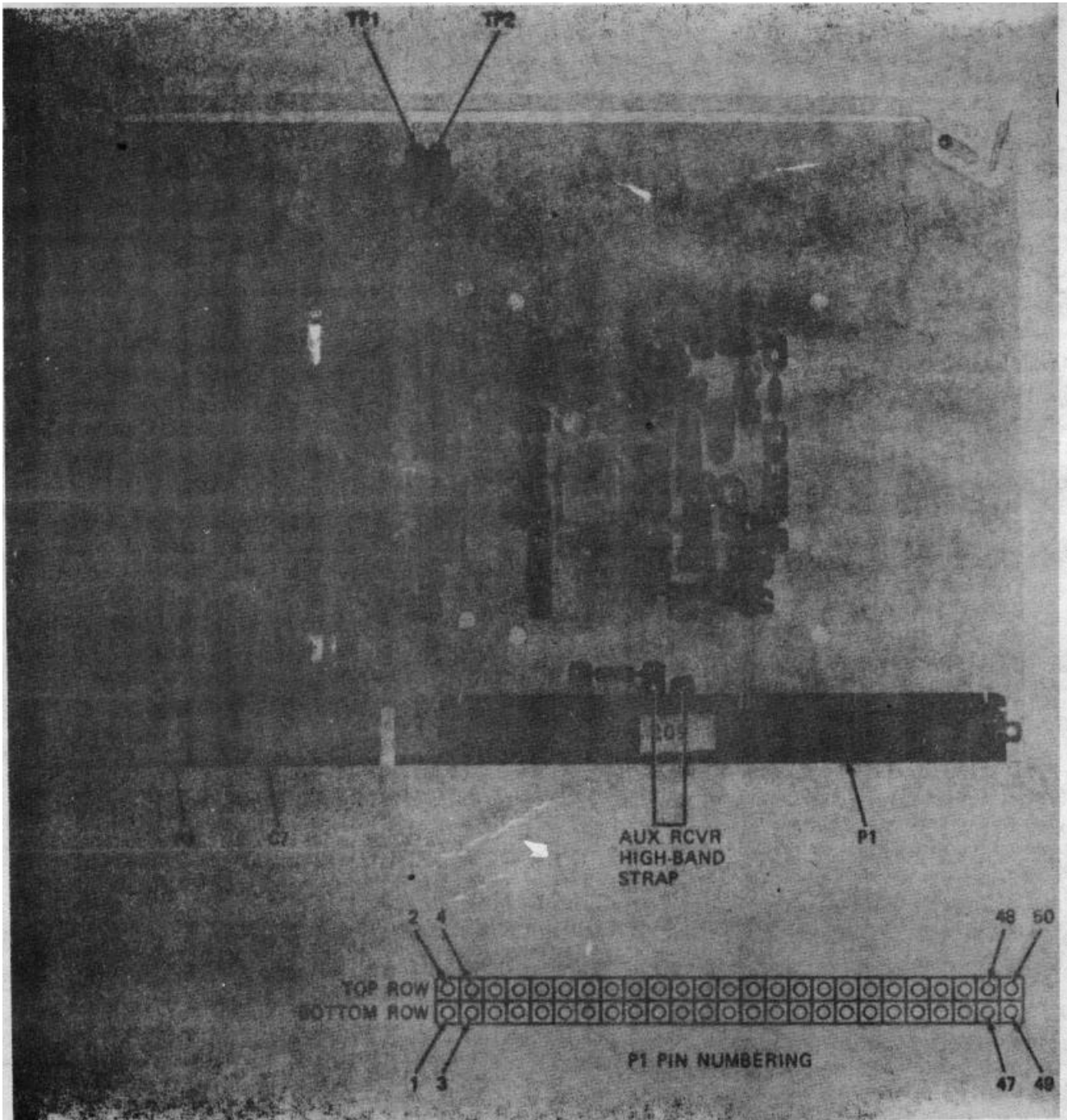


Figure 1-17. Injection oscillator card.

CHAPTER 2

SERVICE UPON RECEIPT AND INSTALLATION

Section I. SITE AND SHELTER REQUIREMENTS

2-1. Installation Planning

Radio Set AN/URC-80(V)1/3 is versatile and can be operated on several different types of power; therefore, siting or location of the units is not critical. However, the following factors should be considered when determining the location of the units.

a. Radio Receiver-Transmitter RT-1061/URC-80[V]. The rt unit should always be mounted on a vertical surface such as a wall, bulkhead, or equipment rack and in a well ventilated area. In addition, the rt unit should be mounted with the connectors down. When mounted in this manner, the vertical cooling fins on each end of the rt unit are better exposed to the natural flow of air. The chassis of the unit is not hermetically sealed, so it allows for an intake and exhaust of air when subjected to varying temperatures. A foam tape inside the cover seals the unit on three sides. The bottom side (side with connectors) is not sealed. Another important consideration is the availability of primary power. The rt unit should be mounted near a primary power source such as ac outlets, batteries, and boat, ship, or vehicle dc outlets. Refer to paragraph 1-9a for information on the types of primary power that may be used. Antenna location is another factor to consider when locating the rt unit. The antenna used with the radio set must be mounted in a high place where it is free of obstructions that may interfere with the line-of-sight transmission and reception paths. The coaxial cable between the rt unit and the antenna should be kept as short as possible and routed in a neat orderly manner with a minimum number of bends. When long antenna coaxial leads are required at a particular installation, RG-213 coaxial cable should be used.

b. Receiver-Transmitter Control C-8981/URC-80[V]. The control unit should be located in a place convenient to the operator and must be within the 25-foot limitations determined by the length of the control cable. Position the control unit so that sharp bends in the control cable can be avoided. The control unit can be mounted in any position, but allow sufficient room to make cable connections to the five external jacks.

c. Loudspeaker LS610/UR. Loudspeakers for the main and auxiliary receivers may be mounted in any place that provides adequate reception. The loudspeakers can be mounted on a wall, bulkhead, or a flat surface. The distance between the loudspeakers and the J3 and J4 connectors on the control unit is not critical. These connections are made with standard unshielded 22 AWG telephone wire or WD-14/TT field wire.

d. Strapping Options. The following strapping options must be considered when planning an installation.

(1) *Power Supply Strapping.* Power supply 6A7 must be strapped to accommodate the primary power used. Refer to paragraph 2-7 e for a detailed description of the power connections and the strapping options.

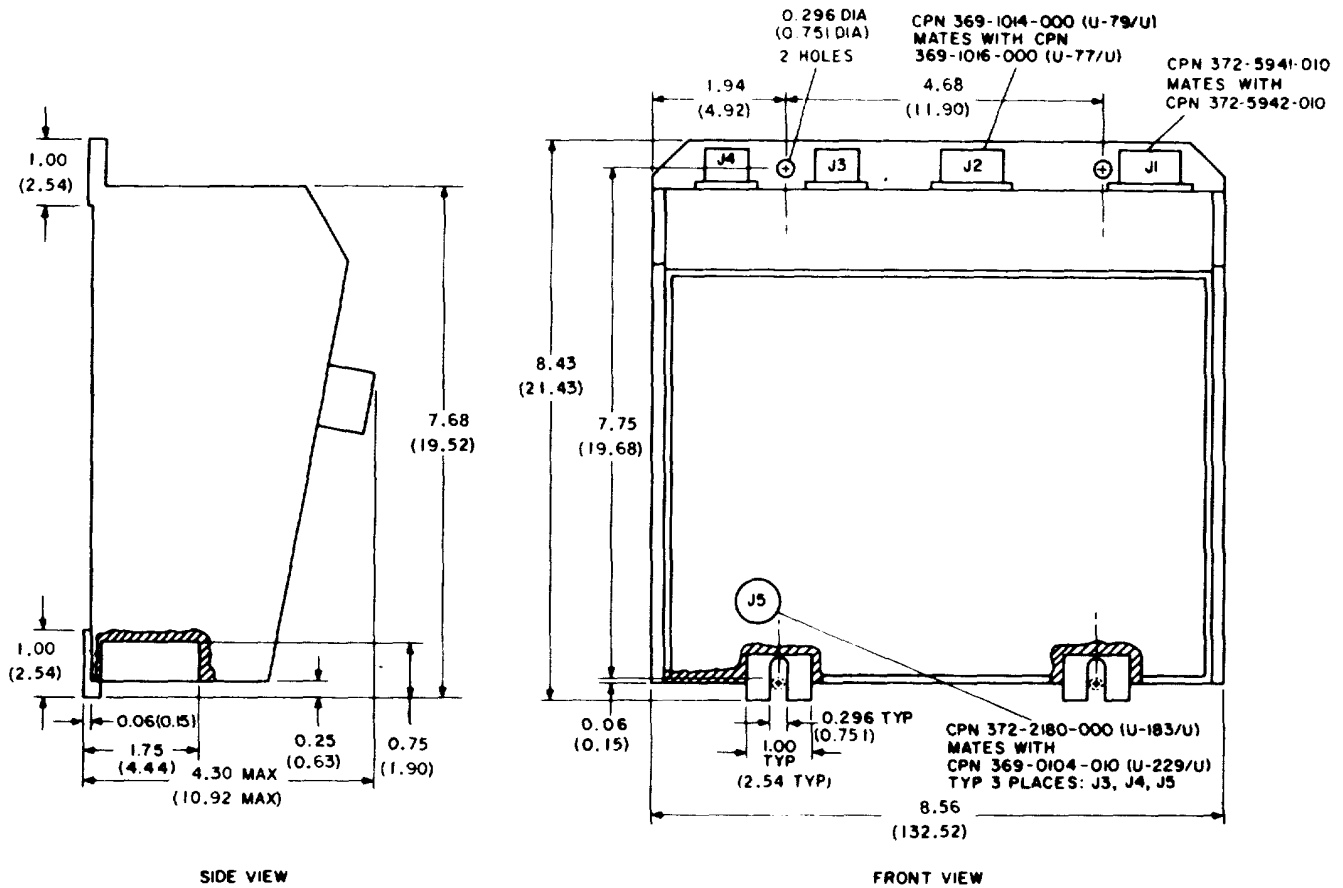
(2) *Main/Auxiliary Receiver Strapping.* Power amplifier module 6A1 contains strapping options that determine whether the radio set, will operate with only the main receiver or with both the main and auxiliary receivers. Paragraph 1-9 c describes this option.

(3) *Dual Monitor Audio Strapping.* Strapping options on audio/squelch card 6A5 enable reception of both the main and auxiliary receivers on one loudspeaker, or connect the audio from each receiver to separate loudspeakers. Refer to paragraph 2-9d for details.

(4) *Auxiliary Receiver High-Band/Low-Band Strapping.* Strapping on injection oscillator card 6A10 determines whether the auxiliary receiver operates on the high or low frequency bands. To check this strapping, refer to paragraph 2-9e.

2-2. Shelter Requirements

No special housing or shelter requirements are needed for units of the AN/URC-80(V). Outline and dimension drawings for the control unit, handset, loudspeaker, and rt unit are presented in figures 2-1 through 2-4. Weight is not an important factor in installation because all the units are of lightweight construction. Refer to paragraph 1-9b for exact weight of each unit.

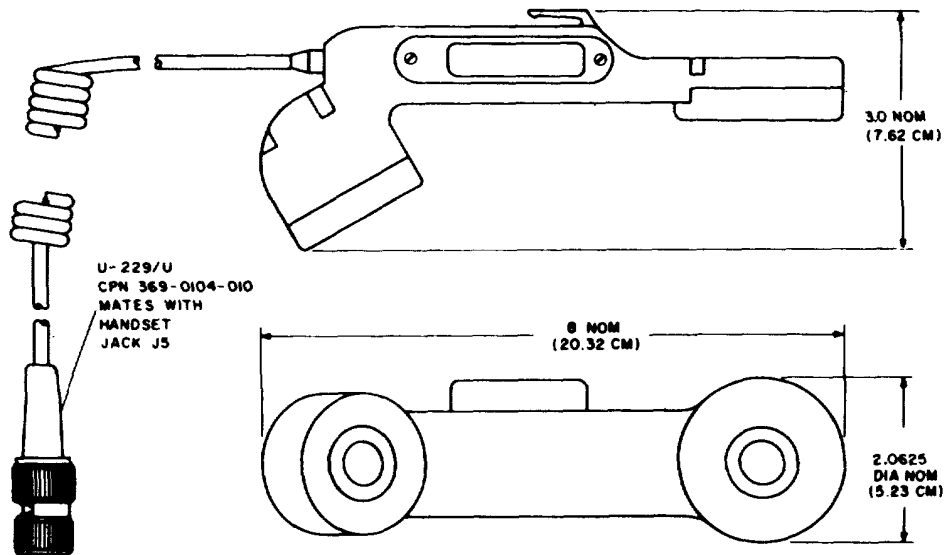


NOTES:

- UNLESS OTHERWISE STATED: DIMENSIONS ARE IN INCHES WITH CM EQUIVALENT IN ()
- MOUNT USING TWO 0.296 DIA HOLES AND TWO 0.296-IN SLOTS. USE 0.250 DIA BOLTS 303 CRES OR EQUAL.

EL5820-820-12-TM-1

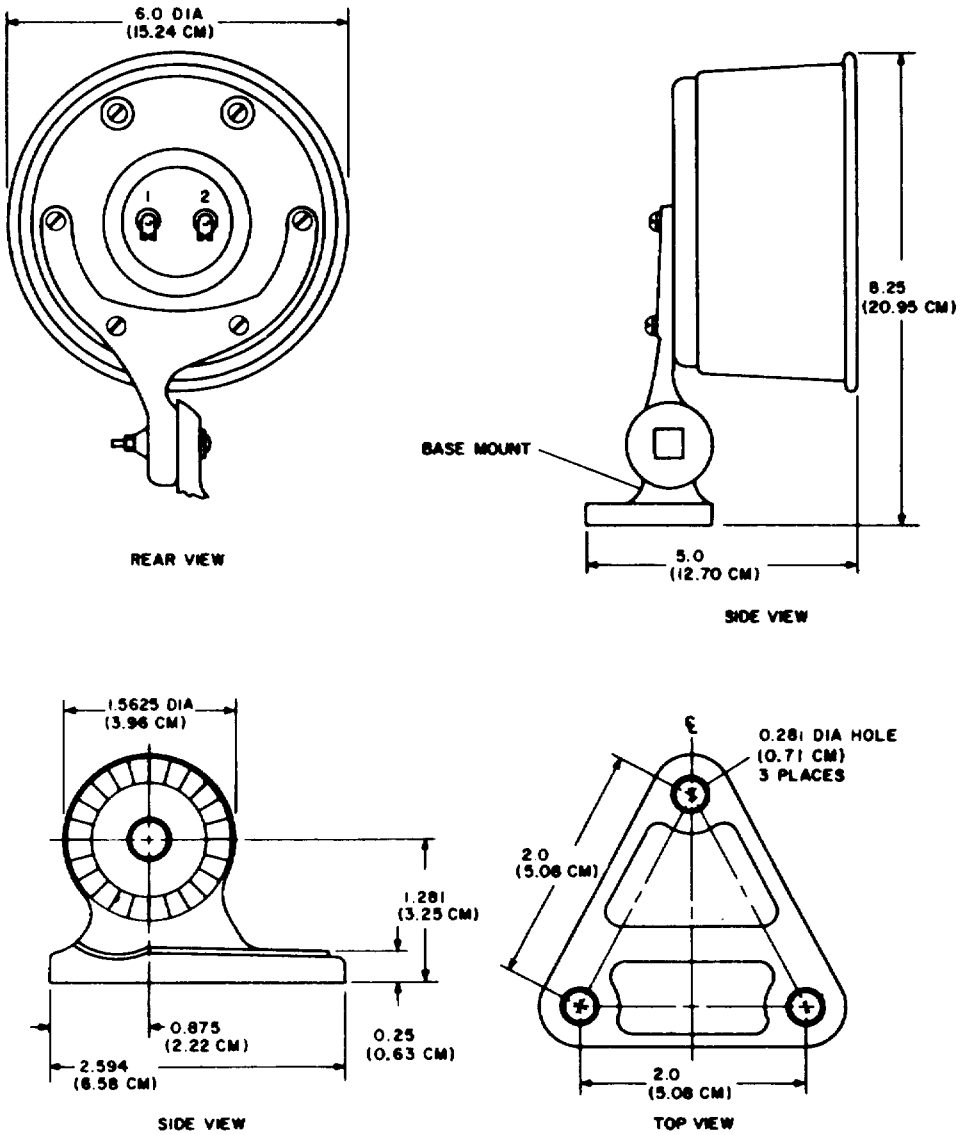
Figure 2-1. Receiver-Transmitter Control C-8981/URC-80[V], installation drawing.



NOTE:
 UNLESS OTHERWISE STATED:
 DIMENSIONS ARE IN INCHES
 WITH CM EQUIVALENT IN ()

EL 5820-820-12-TM-3

Figure 2-2. Handset H-189/GR, installation drawing.



NOTE:
UNLESS OTHERWISE STATED:
DIMENSIONS ARE IN INCHES WITH CM EQUIVALENT IN ()

EL5820-820-12-TM-4

Figure 2-3. Loudspeaker LS-610/UR installation drawing.

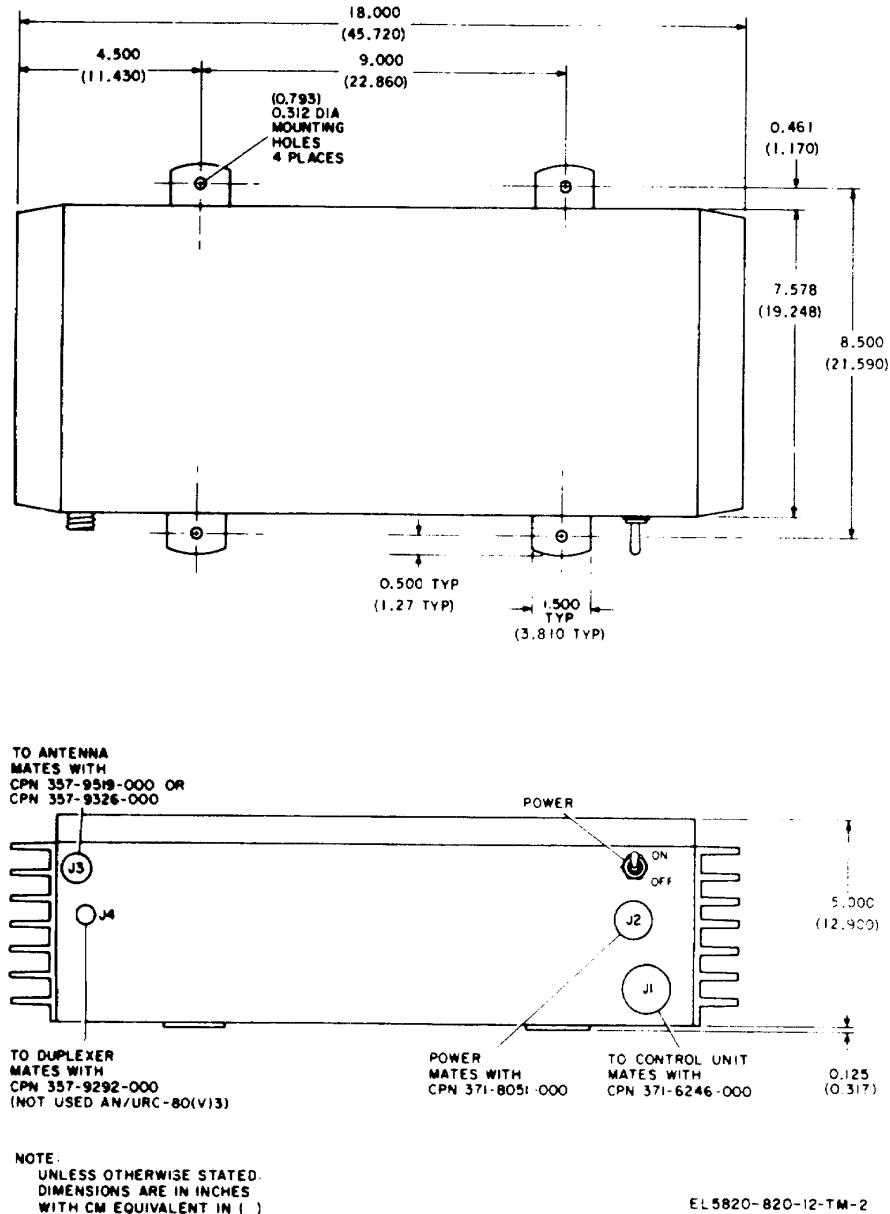


Figure 2-4. Radio Receiver Transmitter RT-1061/URC-80[V] installation drawing.

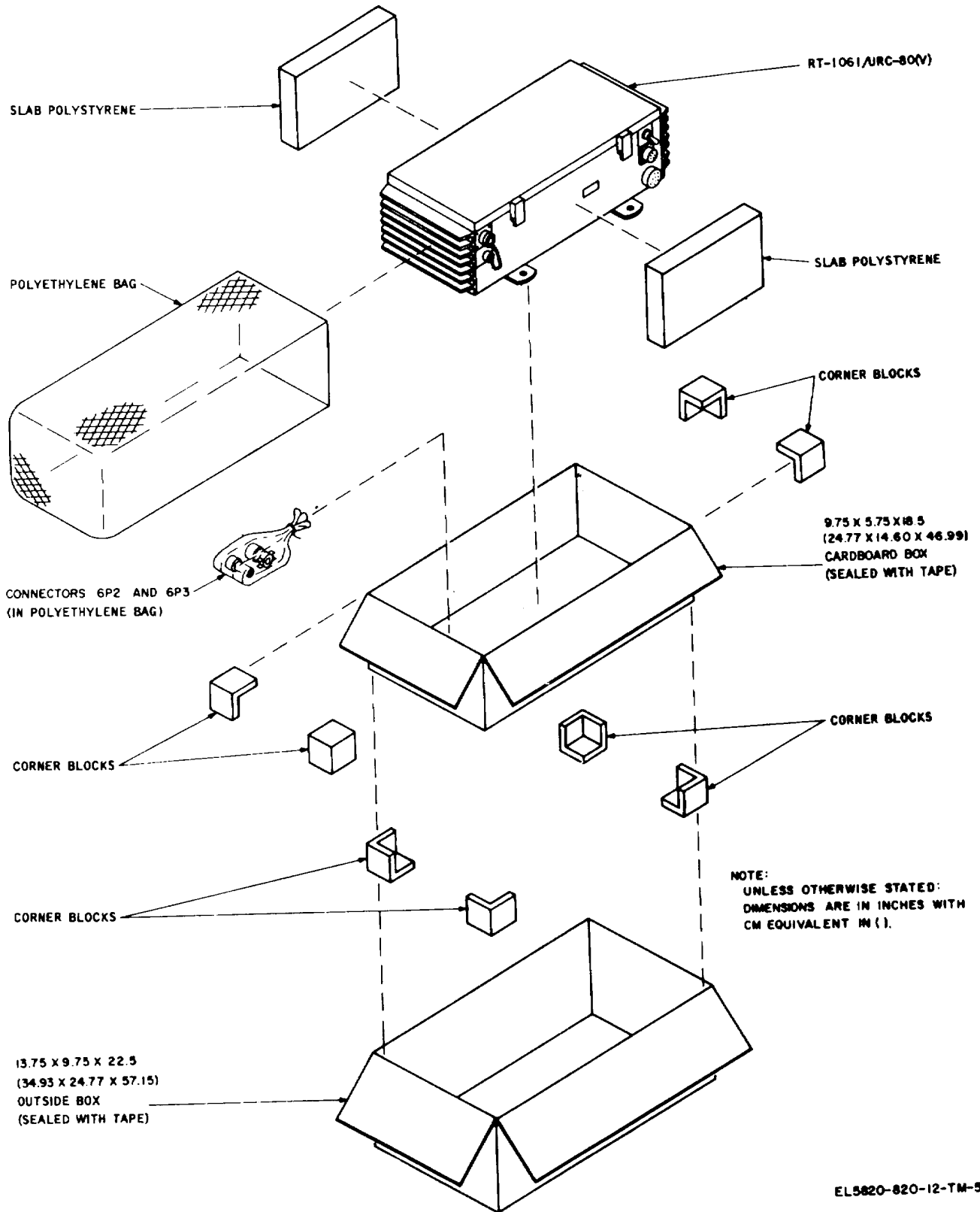
Section II. SERVICE UPON RECEIPT OF MATERIAL

2-3. Unpacking

a. *Packaging Data.* The AN/URC-80(V)1/3 is shipped from the factory in two boxes. Figure 2-5 shows typical packing for carton 1, which contains the rt unit, power connector 6P2, and antenna connector 6P3. The remaining units are packed in the second carton as shown in figure 2-6.

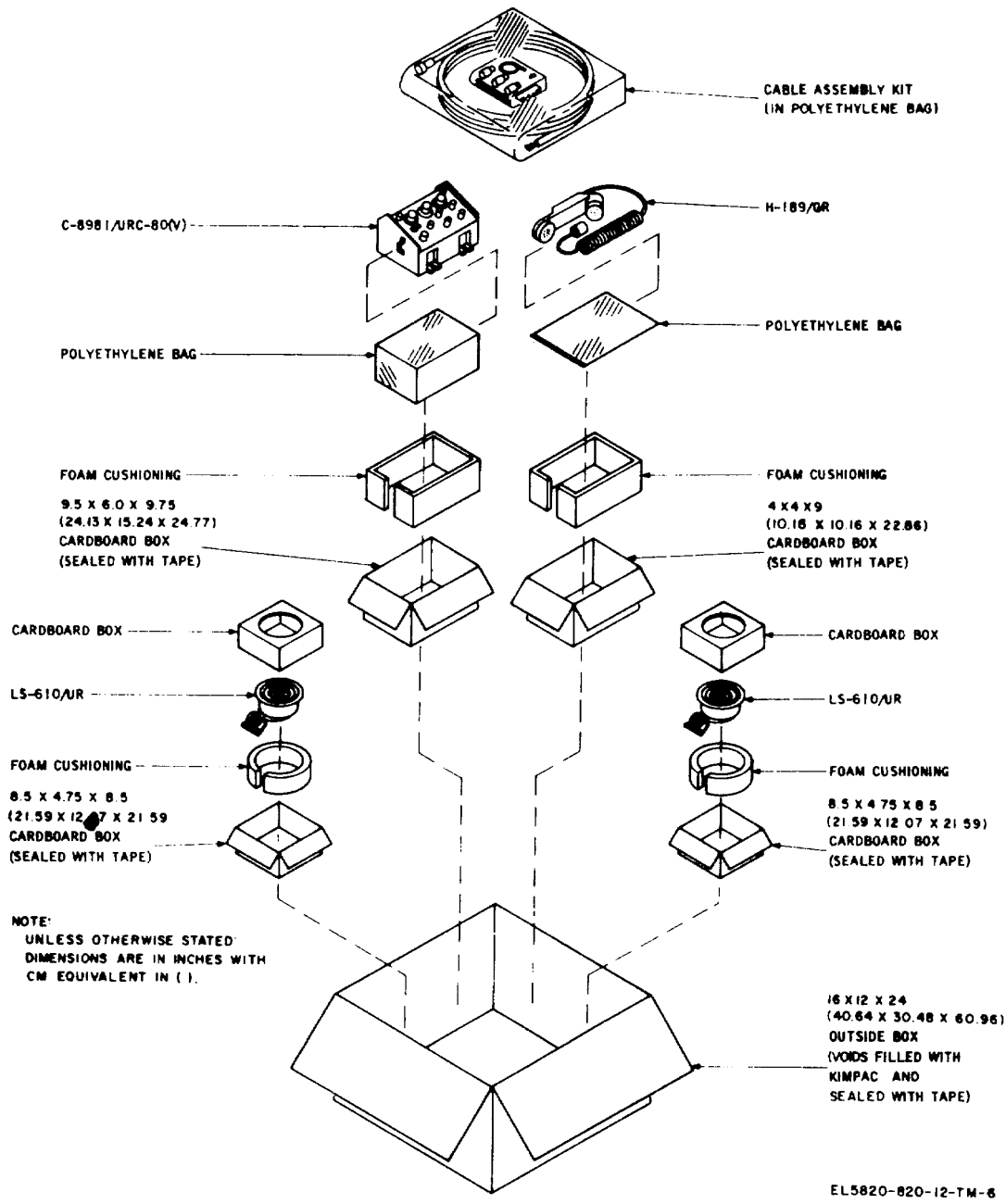
b. *Removing Contents.*

- (1) Cut or tear the sealing tape from the top, of the outside carton, and fold back the top flaps.
- (2) Remove the individual cartons that contain units of the radio set (figures 2-5 and 2-6).



EL5820-820-12-TM-5

Figure 2-5. Typical packing for RT-1061/URC-80[V].



EL5820-820-12-TM-6

Figure 2-6. Typical packing for C-8981/URC-80 V], H-189/GR, LS-610/UR, and cable assembly kit.

CAUTION

When cutting or removing the sealing tape on the individual cartons, do not allow the cutting object to penetrate the carton or damage to the unit may result.

(3) Cut or tear the sealing tape from all the individual cartons except the cable assembly kit and remove the units.

CAUTION

When removing parts from the polyethylene bag that contains the cable assembly kit, use care not to misplace any of the small plastic bags that contain the sleeving, connectors, and other small items that comprise the kit. Refer to table 1-1 and figure 1-2 for a list of parts in the cable assembly kit.

(4) Remove the polyethylene bag from the

cable assembly kit, inventory the contents, and place the small items aside in a safe place until they are needed for installation.

2-4. Checking Unpacked Equipment

a. Inspect the equipment for damage incurred during shipment. If the equipment has been damaged, report the damage on DD Form 6 (para 1-2).

b. Check the equipment against the component listing in the operator's manual and the packing slip to see if the shipment is complete. Report all discrepancies in accordance with paragraph 1-2.

The equipment should be placed in service even though a minor assembly or part that does not affect proper functioning is missing.

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

d. For dimensions, weights, and volume of packaged items, see SB 700-20-1.

Section III. INSTALLATION INSTRUCTIONS

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

Table 2-1 lists the tools, test equipment, and materials required to install Radio Set AN/URC-80(V)1/3.

These items are in addition to the connectors, sleeving, etc, furnished in the cable assembly kit (table 1-1).

Table 2-1. Tools, test equipment and materials required

Items	Purpose	Applicable publication	Items	Purpose	Applicable publication
Drill, Electric Portable (FSN 5130-293-1846)	Drill mounting holes	NA	Coaxial Cable (RG-213)	Connect antenna	NA
Drill Bits, High-Speed 1/4 in. IFSN 5133-227-9658)	Drill mounting holes	NA	Telephone Wire (W-2 #14 AWG copper or W-74 #12 AWG copper) or Telephone Cable (FSN 6145-635-4640)	Connect loudspeakers	NA
17/64 in. (F S N 5133-227-9659)			0.250-Inch-Diameter Bolts (303 corrosion-resistant steel or equal) 14 required	Mount units of radio set	NA
9/32-in. (FSN 5133-227-9660)			0.250-Inch-Diameter Lag Bolts (303 corrosion-resistant steel or equal) 6 required if loudspeakers are mounted on wooden surface	Mount loudspeakers	NA
5/32 in. (F S N 5133-227-9652)			Flat Washers for 1/4-Inch Bolts, 5/8 Inch OD (303 corrosion-resistant steel or equal) 14 required	Mount units of radio set	NA
0.312-in. (FSN 5133-227-9662)			Power Cable 16 AWG, 3-conductor or 5-conductor)	Connect power to radio set	NA
Soldering Iron, 30-Watt (FSN 3439-542-0454)	Install cable connectors	NA	Multimeter TS-352/B (vom)	General installation	
Wrench, Open-End, Adjustable (FSN 5120-264-3795)	Tighten mounting bolts	NA			
Screwdriver Set, Cross Tip (FSN 5120-357-7175)	Disassemble units of radio set	NA			
Screwdriver, Flat Blade (FSN 5120-988-7079)	Install mounting bolts	NA			
Pocket Knife (FSN 5110-240-5943)	Install cables	NA			
Pliers, Diagonal Cutting (FSN 5110-806-9551)	Install internal straps	NA			
Wire Stripper (FSN 5110-268-4224)	Install cable connectors	NA			

2-6. Installation Instructions

a. *Radio Receiver-Transmitter RT-1061/URC-84 V) or RT-1060/URC20(V)*. To install the RT-1061/URC-80(V) or RT-1060/URC-80(V), proceed as follows:

(1) Refer to paragraph 2-1a and figure 2-4 and determine the mounting location for the rt unit.

(2) Drill four 0.312-inch-diameter mounting holes in the mounting surface at the locations shown in figure 2-4.

(3) Select four 0.250-inch-diameter bolts (303 corrosion-resistant steel or equivalent). The length of these bolts is determined by the thickness of the mounting surface. Install a flat washer under each bolt head and install the four bolts in the mounting holes of the unit.

(4) Orient the unit with the connectors facing downward and push the four bolts through the holes in the mounting surface.

(5) Install a flat washer and nut on each of the four bolts.

(6) Use an adjustable wrench to secure the four nuts.

b. *Receiver-Transmitter Control C-8981/URC-80(V)*. To install the C-8981/URC-80(V), proceed as follows:

(1) Refer to paragraph 2-1b and figure 2-1 and determine the mounting location for the control unit.

(2) Drill four 0.296-inch-diameter holes in the mounting surface at the locations shown in figure 2-1.

(3) Select four 0.250-inch-diameter bolts (303 corrosion-resistant steel or equivalent). The length of the bolts is determined by the thickness of the mounting surface. Install a flat washer under each bolt head.

(4) Install two of the bolts in the bottom mounting holes drilled in step (2). Place a flat washer and nut on each of the two bolts. Do not tighten the nuts at this time.

(5) Position the C-8981/URC-80(V) so that the two bolts installed in step (4) fit in the two mounting slots at the bottom of the control unit. Be sure that the slots fit behind the flat washers under the bolt heads.

(6) Install the remaining two bolts through the two top mounting holes in the control unit and the holes drilled in the mounting surface. Install a flat washer and nut on each bolt.

(7) Use an adjustable wrench to tighten the four nuts.

c. *Loudspeakers LS-610/UR*. To install the two loudspeakers, proceed as follows:

(1) Refer to paragraph 2-1c and figure 2-3 and determine the mounting location for the two loudspeakers.

(2) Remove the wingnut and bolt that holds the loudspeaker assembly on the base.

(3) If the mounting surface is metal, drill three 0.296-inch-diameter holes at the locations shown in figure 2-3. If the mounting surface is wood, drill three 0.125-inch-diameter holes at the locations shown in figure 2-3.

(4) If the mounting holes drilled in step (3) are 0.296 inch, select six 0.250-inch-diameter bolts (303 corrosion-resistant steel or equivalent). The length of the bolts is determined by the thickness of the mounting surface. If the mounting holes drilled in step (3) are 0.125 inch, select six 0.250-inch-diameter lag bolts 1 inch long.

(5) Install the two loudspeaker bases using either the bolts and nuts or the lag bolts. Use an adjustable wrench to tighten the nuts or lag bolts.

(6) Install the loudspeakers on the bases using the bolts and wingnuts removed in step (2).

d. *Handset H-189/GR*. The physical dimensions and outline of Handset H-189/GR are shown in figure 2-2.

(1) Connect P1 on the handset to HANDSET jack J5 (figure 1-3) on the front of the C-8981/URC-80(V).

(2) Hang the hook on the handset in the handset bracket (figure 1-3) on the left side of the C-8981/URC-80(V).

NOTE

If so desired, the handset bracket may be removed from the left side of the C-8981/URC-80(V) and installed on the right side. To do this, remove the two screws that attach the handset bracket to the C-8981/URC-80(V). Then move the handset bracket to the right side and secure it by installing the screws in the holes provided.

2-7. Interconnections

a. *General*. The interconnection requirements for the AN/URC-80(V) 1/3 are illustrated in figure FO-1, and table 2-2 lists the name, connection points, and type of cable required. Control cable 1WI that connects the rt unit and the control unit is the only cable supplied with the AN/URC-80(V) 1/3. Connectors to fabricate the remaining cables are supplied in the cable assembly kit and with the rt unit. Connector 1P2 (figure FO-1) is included in the cable assembly kit but is not used in the AN/URC-80(V)1/3 configuration. The following paragraphs contain procedures for fabricating the required cables.

b. *Control Cable 1W1 Assembly.* Control cable 1W1 is supplied with connector 1W1P2 (figure FO-1) installed on the cable. After the control unit and the rt unit are installed, connector 1W1P2 is connected to jack J1 CONTROL (figure 1-3) on the control unit. The cable is then routed to the rt unit and any excess cable is cut off before connector 1P1 is installed. To install connector 1P1, proceed as follows:

(1) Read the following steps and refer to figures 1-2, 2-7, and FO-1 before attempting to install the connector.

(2) Cut control cable 1W1 to a length that will permit easy connection to jack 6A8W9J1 on the rt unit (figure 1-6).

(3) Slip a 3-inch piece of heat shrink sleeving (table 1-1 and step C, figure 2-7) over the cut end of the cable.

(4) Unscrew the top part of connector 1P1 (table 1-1) and slip the top and center parts (figure 2-7) on the cable. The strain relief grip on the top part of the connector and the knurled end of the center part must be toward connector 1W1P2 (figure 2-7).

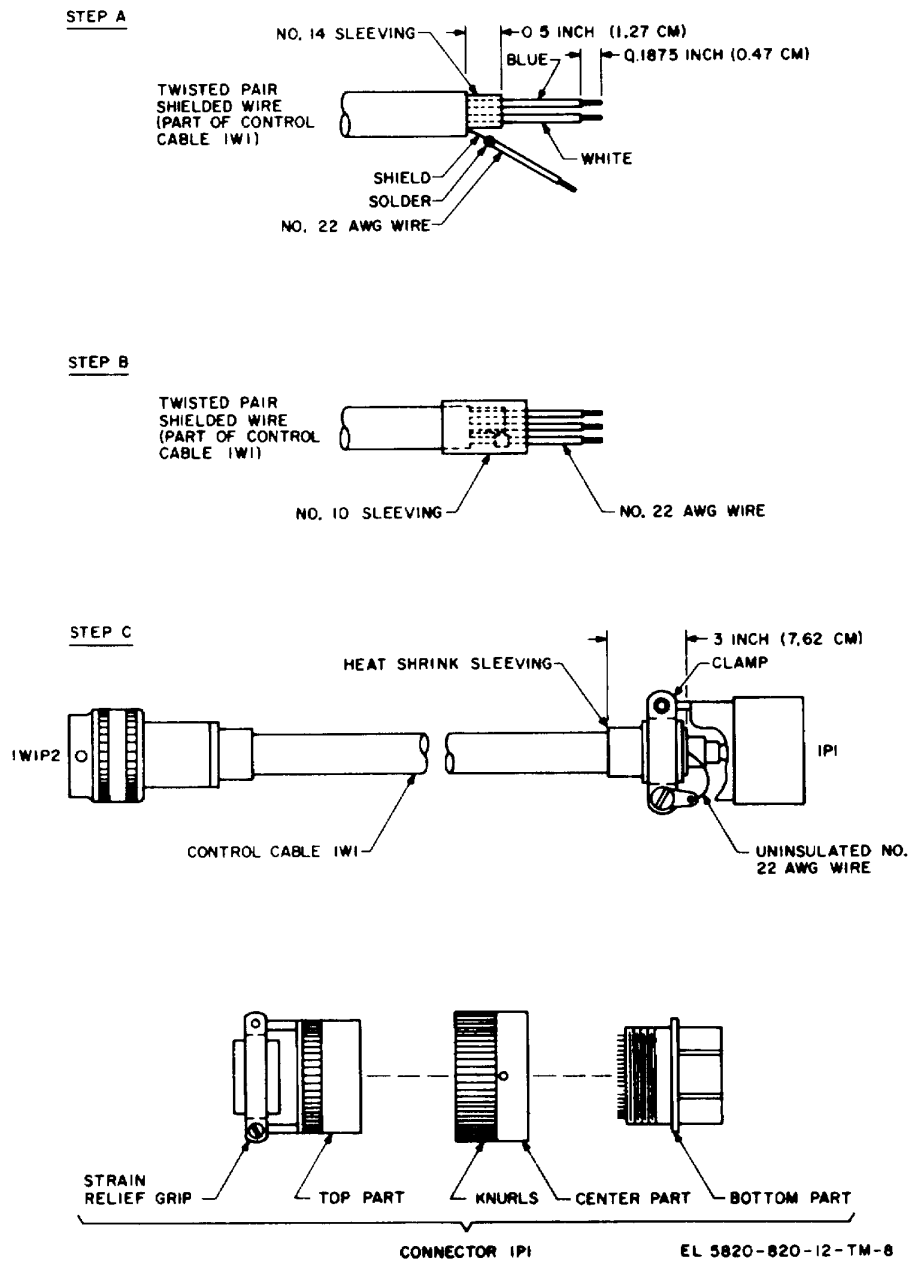


Figure 2-7. Control cable 1W1 assembly.

Table 2-2. Interconnect cables

Cable name	Connects from/to	Type
Control cable 1W1	C-8981/URC-80 (V) t o RT-1061/URC-80(V)	36-conductor special purpose
Power cable	Power source to RT-1061/URC-80(V)	4 to 18 AWG depending upon input voltage and length of cable. Refer to figure FO-1.
Antenna cable	RT-10 61/URC-80(V) to antenna	RG-213 coax
Main receiver loudspeaker cable	C-8981/URC-80(V) to LS-610/UR (main rcvr)	WD-1 TT field wire or W-74 #12 AWG copper wire
Auxiliary receiver loudspeaker cable	C- 8981/UR C-80(V) to LS-610/UR (aux rcvr)	WD-1 TT field wire or W-74 #12 AWG copper wire
Handset cable (part of H-189/GR)	H-189/GR to C-8981/URC-80(V)	4-conductor special purpose

CAUTION

When removing jacket material or insulation from conductors in the cable, use care not to cut any of the wires or shields inside the cable.

(5) Remove 2.25 inches of jacket material from the end of the cable.

(6) Refer to figure FO-1 and cut off the following unused wires even with the outer jacket of the cable:

- WHT-BLU-VIO WHT-BRN-GRN
- WHT-BLK-ORN WHT-BRN-BLU
- WHT-BLK-GRN WHT-RED-GRN
- WHT-BLK-BLU WHT-ORN-BLU
- WHT-BRN-RED WHT-BRN-GRA
- WHT-BRN-ORN

(7) Remove 2.25 inches of the white jacket material from the shielded pair of wires.

(8) Slip a 0.5-inch length of no. 14 sleeving (table 1-1) over the blue and white wires as shown in step A, figure 2-7.

(9) Solder a piece of 22 AWG wire (table 1-1) to the shield of the twisted pair (step A, figure 2-7). Cut the wire to the exact length as the blue and white wires and remove 0.1875-inch of the insulation from all three wires.

(10) Slip a 1-inch length of no. 10 sleeving (table 1-1) over the three wires as shown in step B, figure 2-7.

(11) Remove 0.1875-inch of insulation from the end of the remaining wires to be connected (figure FO-1).

(12) Slip a short length of no. 17 sleeving (table 1-1) over the end of each of the 26 wires to be

connected (includes three wires shown in step B, figure 2-7).

(13) Solder the 26 wires to the bottom half of connector 1P1 (table 1-1) as indicated in figure FO-1.

(14) Slide the sleeving installed in step (12) down over each soldered connection.

(15) Solder a short length of no. 22 AWG wire (table 1-1) to the uninsulated wire in cable 1W1. Remove the insulation from this wire. Slide the heat shrink sleeving installed in step (3) down toward the end of the cable as shown in step C, figure 2-7.

(16) Slide the top and center part of connector 1P1 down the cable and thread the uninsulated wire (installed in step (15)) through the center and top parts of the connector as shown in step C, figure 2-7.

(17) Cut the uninsulated wire to a length suitable for connection to a bolt on the strain relief grip (step C, figure 2-7).

(18) Solder the no. 8 lug (table 1-1) to the uninsulated wire.

(19) Assemble the three parts of connector 1PI by screwing the top part into the bottom part.

(20) Install the no. 8 lug on the uninsulated wire under one of the bolts of the strain relief grip.

(21) Position the heat shrink sleeving (installed in step (3)) as shown in step C, figure 2-7.

Apply heat in excess of 121° C until the sleeving shrinks and fits snugly around the cable.

(22) Tighten both bolts until the strain relie grip holds the cable securely.

c. *Antenna Cable Assembly.* The antenna cable is not furnished with the AN/URC-80(V) 1/3, but connector 6P3 (figures 1-6 and FO-1) is furnished with the rt unit. To assemble connector 6P3 on RG-213 coaxial cable proceed as follow s.

(1) Refer to figure 2-8 and read the following steps carefully before proceeding with the assembly.

(2) Strip the cable jacket, braid, and dielectric to the dimensions shown in figure 2-8. Do not nick the braid, dielectric, or center conductor.

(3) Use a 30-watt soldering iron to tin the center conductor. Avoid use of excessive heat.

(4) Place the contact (figure 2-8) on the center conductor so that it butts against the cable dielectric. The center conductor should be visible through the inspection hole in the contact.

(5) Solder the contact to the cable center conductor. Do not get any solder on the outside of the contact. Avoid use of excessive heat to prevent the dielectric from swelling.

(6) Slide the clamp nut, gasket, and braid ferrule on the cable as shown in figure 2-8.

(7) Position the braid clamp over the exposed braid of the cable (figure 2-8).

(8) Slide forward as a unit the braid ferrule (tapered end toward the body assembly), gasket, and clamp nut until the threads of the clamp nut engage with the threads of the body assembly.

(9) Tighten the clamp nut until it bottoms on the body assembly. This degree of tightness affords maximum cable retention.

d. Loudspeaker LS-610/UR Wiring. The loudspeakers for the main and auxiliary receivers can be connected with any suitable 12 or 14 AWG telephone or field wire, or any suitable two conductor cable.

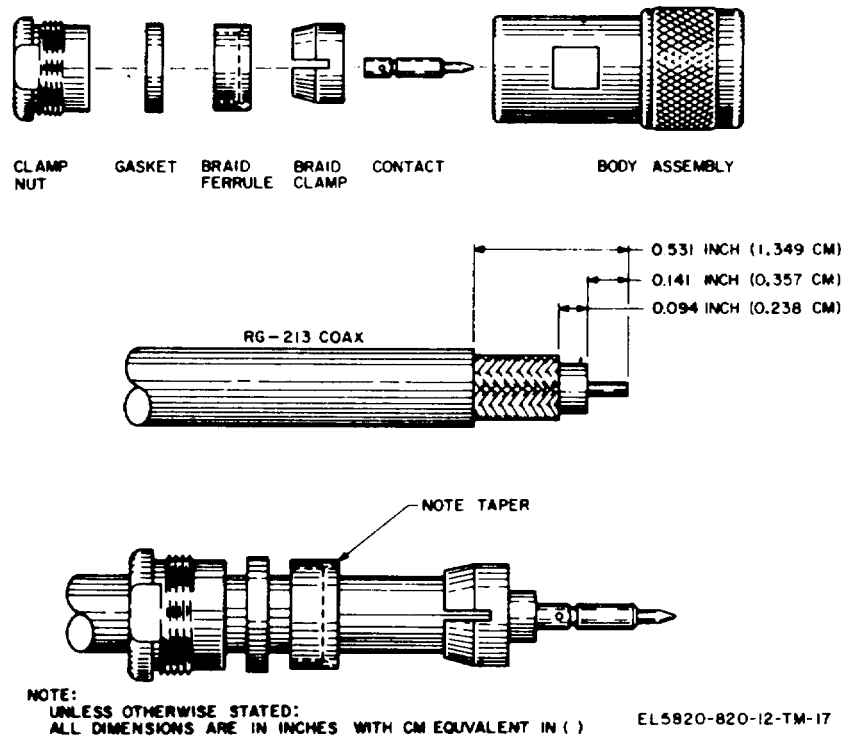


Figure 2-8. Antenna cable assembly.

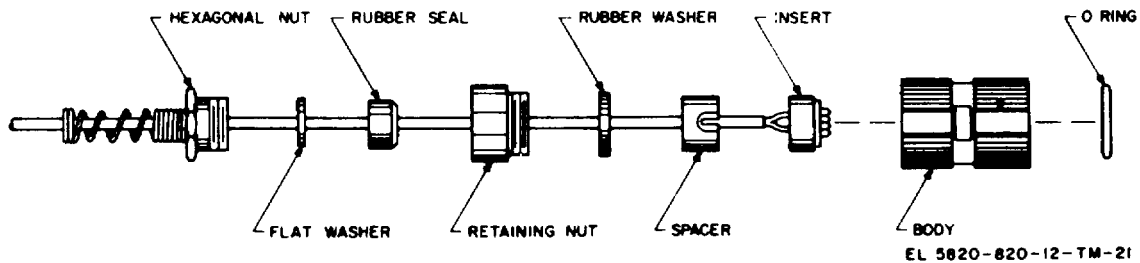


Figure 2-9. Loudspeaker LS-610/UR connector 1P3 and 1P4 assembly.

Wire or cable for these connections is not furnished with the AN/URC-80(V)1/3 but connectors 1P3 and 1P4 (table 1-1 and figure FO-1) are supplied in the cable assembly kit. To connect the two loudspeakers to the control unit, proceed as follows:

(1) Disassemble connector 1P3 and slide the two conductors through the hexagonal nut, the flat washer rubber seal, retaining nut rubber washer and spacer in the order shown in figure 2-9. Be sure that the indented slit in the spacer is toward the insert.

(2) Remove 0.1875-inch of insulation from each conductor and solder them to pins A and E of the insert (figure FO-1). Do not apply excessive heat when soldering.

(3) Place the threaded end of the body toward the insert. Align the index of the insert with the grooves in the body and push the insert into place in the body.

(4) Slide the spacer down over the solder connections, the rubber washer, and retaining nut into place over the spacer. Hold the body, and screw the retaining nut into the body. Use an adjustable wrench to tighten the retaining nut.

(5) Slide the rubber seal and flat washer into the retaining nut. Hold the body, and screw the hexagonal nut firmly into the retaining nut.

(6) Connect the other end of the two conductors to terminals 1 and 2 (figure 2-3) of the loudspeaker for the main receiver. To make these connections proceed as follows:

(a) Remove approximately 0.5 inch of insulation from the end of each wire or conductor. Use care not to nick the wire.

(b) Use a soldering iron to tin the ends of the wire.

(c) Observe the wiring in figure FO-1 and slide the tinned ends of the wire in terminals 1 and 2 of the loudspeaker. Bend the terminals slightly to hold the wires in place.

(d) Solder the wires to the terminals using care not to overheat.

(7) Connect the loudspeaker for the auxiliary receiver by using connector 1P4 and repeating steps (1) through (6).

e. *Power Connections.*

WARNING

Be sure that the common terminal (pin C) on power connector 6P2 (figure FO-1) is connected to earth or common ship ground. This connection grounds the entire radio set and assures adequate safety.

(1) *General.* The AN/URC-80(V)1/3 has a versatile power supply capable of operating on 115 or 230 volts ac or on 12, 24, or 32 volts dc. Any

combination of one ac voltage and one dc voltage may be strapped on power supply module 6A7 at one time. The radio sets are shipped from the factory strapped to operate on 115 volts ac and 24 volts dc. The selection of ac or dc operation is determined by which voltage is supplied to power connector 6P2 (figure FO-1). If the radio set is to be operated on a voltage other than 115 volts ac or 24 volts dc to strapping on power supply module 6A7 must be changed before primary power is connected to the radio set.

(2) *Changing power supply strapping.* To change the strapping on the power supply module 6A7 proceed as follows:

(a) Release the four latches (figure 1-6) and remove the cover from the rt unit.

WARNING

High voltage dangerous to life, exists in the power supply even when the power switch is set to OFF. Connector 6P2 (figure FO-1) must be disconnected before strapping is changed or a fuse is replaced.

(b) Insure that power connector 6P2 is disconnected from the rt unit.

(c) Use a Phillips no. 1, 1-inch blade screwdriver and remove the screw, flat washer and lockwasher that hold the fuse cover in place (figure 2-10).

(d) Refer to figure 2-11. Note that the two connections to TB1 are for 24-volt dc operation and the two 115-volt straps on TB2 select 115-volt ac operation. To select 12 or 32-volt dc operation, move the two connections on TB1 as indicated in figure 2-11. To change from 115-volt ac operation to 230-volt ac operation, remove the two 115-volt ac straps and add the 230-volt ac strap as shown in figure 2-11.

(e) When the desired strapping is accomplished, replace the fuse cover and secure it with the screw, flat washer, and lockwasher removed in step (c).

(f) Replace the cover on the rt unit.

(3) *Fabricating power cable for only ac or only dc operation.* When it is known that only one type power (ac or dc) will be used to operate the radio set, a three-conductor power cable with no. 16 AWG wire color-coded white, black, and green is recommended. Figure FO-1 lists recommended wire size for different lengths of the power cable, but the power cable should be kept as short as possible and within the limitations specified for no. 16 AWG wire. To fabricate a three-conductor power cable for either ac or dc operation, proceed as follows:

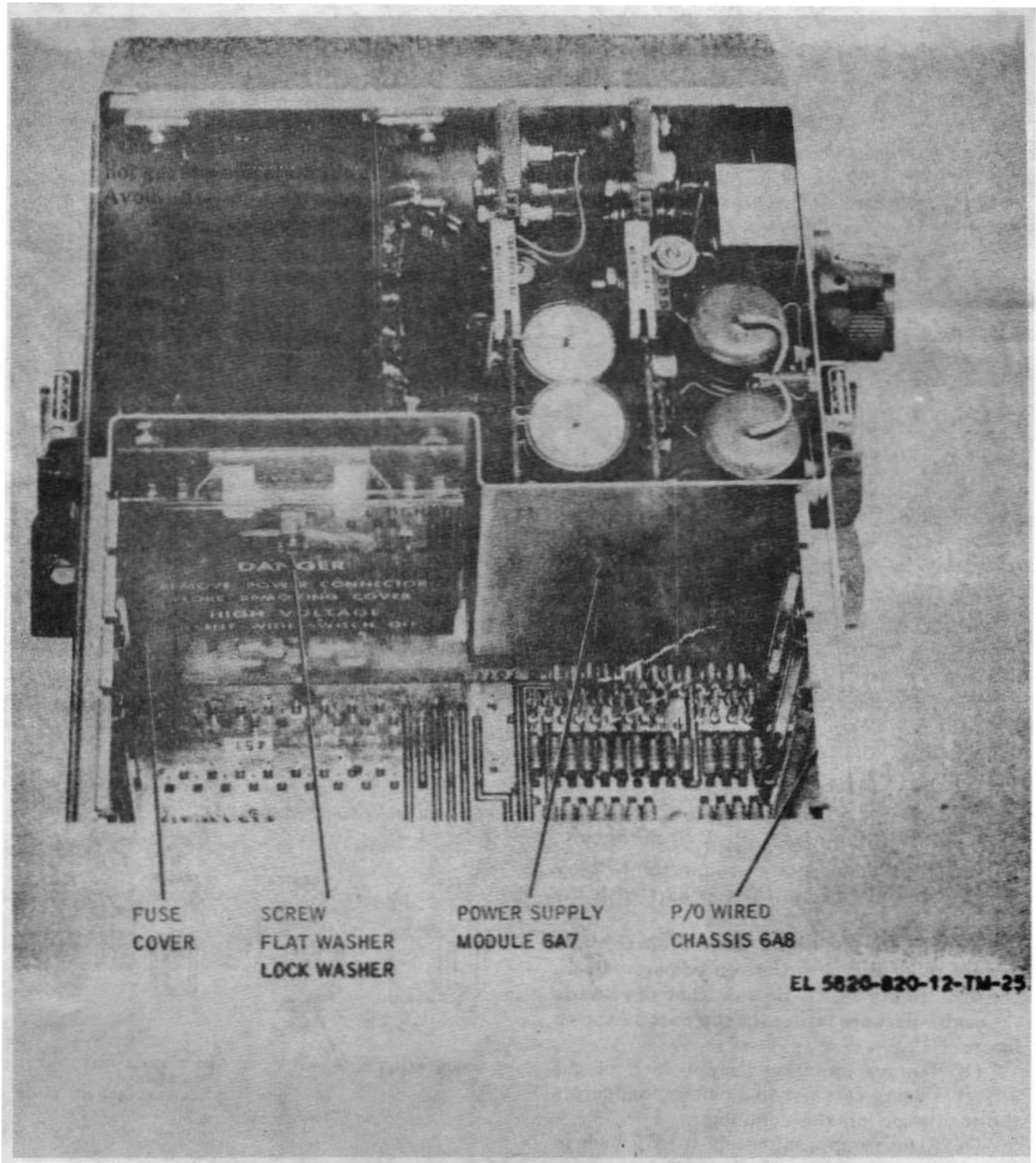


Figure 2-10. Power supply module 6A7 and fuse cover location.

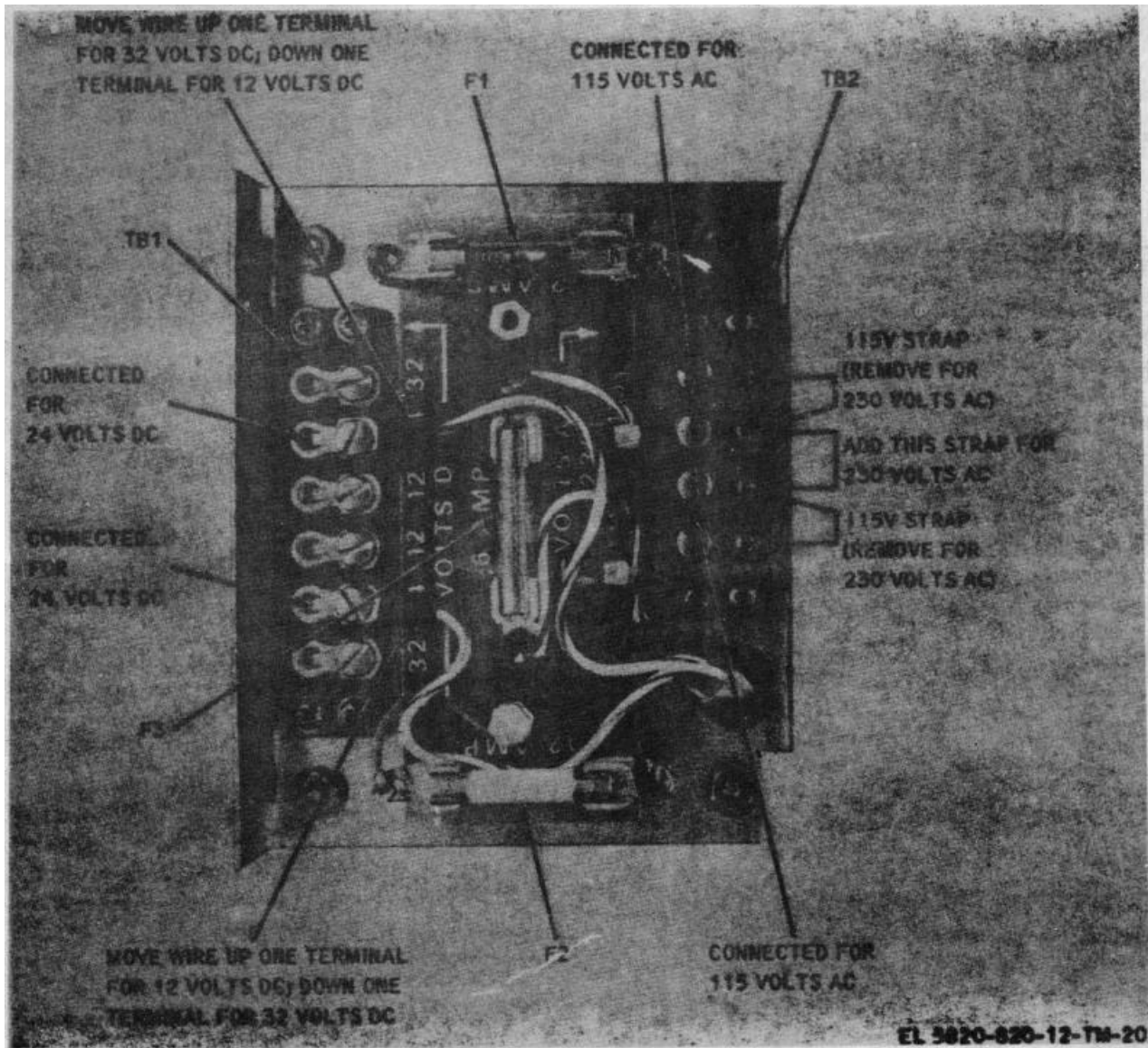


Figure 2-11. Changing strapping options or fuses on power supply module 6A7.

(a) Disassemble power connector 6P2 by unscrewing the body from the top part with the strain relief grip (figure 2-12).

(b) Slip one end of the power cable through the strain relief grip and the center part of connector 6P2 (figure 2-12). Be sure that the knurls on the center part are facing the top part as shown in figure 2-12.

(c) Remove approximately 1 inch of the cable jacket using care not to nick the conductors or the insulation on the conductors.

(d) Remove approximately 0.1875 inch of the insulation from the end of each of the conductors.

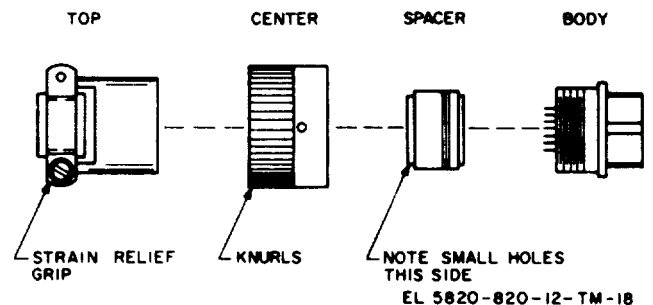


Figure 2-12. Power connector 6P2 assembly.

(e) If the radio set is to be operated on dc, thread the green conductor through the C hole in the spacer, the black conductor through the D hole, and the white conductor through the E hole. Slide the spacer up the conductors until it is flush with the cable jacket. Then solder the three conductors to pins C, D, and E on the body of the connector (figures 2-12 and FO-1). If the radio set is to be operated on ac, the black conductor is thread through hole A of the spacer and the white conductor through hole B. These conductors are then soldered to pins A and B of the body. The green conductor is connected to pin C for both and dc operation.

(f) Slide the spacer down over the pins in the body and the center part over the spacer. Then assemble the connector by screwing the top part with the strain relief grip on the body (figure 2-12).

(g) Tighten the two bolts on the strain relief grip until the cable is held securely.

(h) Connect the other end of the cable to the power source. Be sure that the green conductor is connected to earth ground or ship's ground. The black conductor is connected to the high side for ac and the positive (+) side for dc; the white conductor is connected to the low side for ac and the negative (-) side for dc.

(4) *Fabricating power cable for both ac and dc.* When both ac and dc are available as power sources and it is desirable to switch the type of operation, two cable alternatives are available. First, separate ac and dc power cables may be fabricated as described in step (3) and the cables switched when the type of power is changed. Secondly, a combined ac and dc power cable can be fabricated. This second choice is recommended, but it must include a switching arrangement to prevent the application of both ac and

dc power at the same time. A five-conductor cable with no. 16 AWG wire color-coded white, black, green, red, and violet is recommended for this type cable. To fabricate the cable proceed as follows:

(a) Install connector 6P2 (figure FO-1) in the same manner as described for the three conductor cable in step (3) but connect the black, white, green, red, and violet conductors to pins A, B, C, D, and E of connector 6P2 as shown in figure 2-13.

(b) Connect the other end of the cable to an ac and dc power source through a double-pole double-throw switch as shown in figure 2-13.

2-8. Installation of Plug-in Items.

a. *Auxiliary Receiver and Injection Oscillator Cards.* Radio Receiver-Transmitter RT-1061/URC-80(V) as shipped from the factory does not have an auxiliary receiver capability. This capability is provided by adding auxiliary receiver card 6A9 and injection oscillator card 6A10 (para 1-8) to the rt unit as shown in figure 1-6. To install these cards proceed as follows:

(1) Set power ON-OFF switch 6A7S1 (figure 1-6) on the rt unit to OFF.

(2) Disconnect power connector 6P2 (figure 1-6) from the rt unit.

(3) Release the four latches and remove the cover (figure 1-6) from the rt unit.

(4) Remove strapping connector 6P1 (figure 1-6) from backplane A8A1 in the rt unit. Store this connector in a safe place for future use. When injection oscillator card 6A10 is used, connector 6P1 is not needed, because the strapping on connector 6P1 is also contained on P1 of the injection oscillator card.

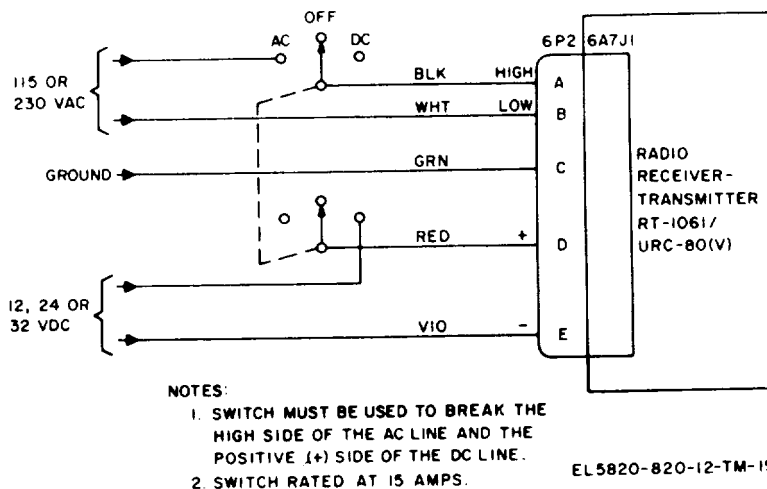


Figure 2-13. Power cable for both ac and dc with manual switchover.

(5) Orient the auxiliary receiver and injection oscillator cards (6A9 and 6A10) so that the component sides are toward power supply 6A7 and slide them into the positions shown in figure 1-6. Be sure that the cards are seated firmly.

(6) Replace the cover, connect the power

cable to the rt unit, and set power ON/OFF switch 6A7S1 as required.

b. *Fuses.* The AN/URC-80(V)1/3 is shipped from the factory with all the fuses in place. Refer to table 2-3, and figures 2-11 and 2-14 for fuse location, size, and function.

Table 2-3. Fuses

Component	Panel designation or circuit	Fuse	Fuse rating		Reference
			Amperes	Volts	
Radio Receiver-Transmitter RT-1061/URC-80(V)	Ac primary	F1	2	250	2-11
Radio Receiver-Transmitter RT-1061 /URC-80(V)	Dc primary	F2	12	125	2-11
Radio Receiver Transmitter RT-1061/URC-80(V)	Secondary center tap	F3	6	125	2-11
Receiver-Transmitter Control C-8981/URC-80(V)	+28 Vdc unregulated	F1	2	125	2-14

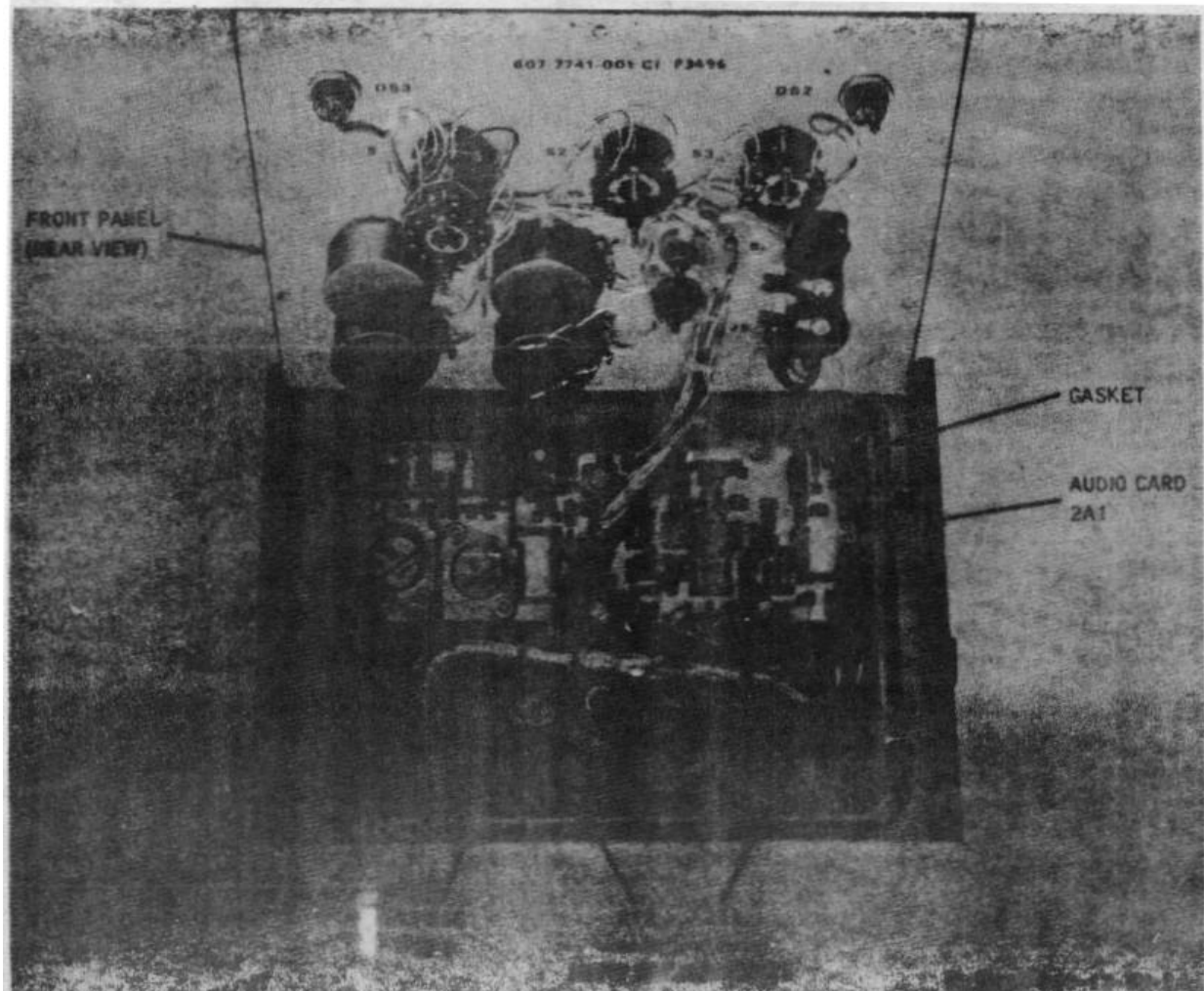


Figure 2-14. Receiver-Transmitter Control C-8981/URC-80(V), inside view.

Section IV. PRELIMINARY ADJUSTMENT OF EQUIPMENT

2-9. Extent of Preliminary Checks and Adjustments

The following paragraphs contain procedures for checking the radio set ground connections, the installation of plug-in subassemblies, and the four available strapping options. These strapping options are located on power supply module 6A7, power amplifier module 6A1, audio/squelch card 6A5, and injection oscillator card 6A10. The strapping options must be checked when the radio set is placed in operation for the first time, when any of the applicable modules or cards are replaced, and when the type of primary power is changed. The strapping option on injection oscillator card 6A10 is applicable only to radio sets equipped with an auxiliary receiver.

a. *Grounding Check.* To insure that the radio set is properly grounded, proceed as follows:

(1) Disconnect power connector 6P2 (figure FO-1) from jack 6A7J1.

(2) Use a vom and measure the resistance between pin C of connector 6P2 and earth or ship's ground. The resistance should be less than 1 ohm to insure adequate grounding for the radio set.

b. *Plug-in Modules, Circuit Cards, and Connectors.* Inspect the following plug-in items and connectors as indicated:

(1) *Circuit cards 6A2 through 6A6 and 6A9 and 6A10.* Insure that they are firmly seated.

(2) *Power amplifier module 6A1.* Insure that the module is secured in the chassis by six screws and lockwashers. Five screws penetrate the heat sink (figure 1-6) and the other is located just below connector 6A1J2.

(3) *Power supply module 6A7.* Insure that the module is secured in the chassis by 10 screws and washers. Three of the screws are located across the bottom edge of the power supply heat sink (figure 1-6), and two at the rear edge of the heat sink near the transformer. Two longer (1/2inch) screws are located adjacent to the cover latch at the rear of the chassis and near the fuse cover. The remaining three screws are located on the front of the chassis near the power ON/OFF switch. Be sure that inverter card 6A77A1 and regulator card 6A7A2 are firmly seated. These cards are secured by six screws and washers located between the fins of the heat sink.

(4) *Connectors.* Refer to figures 1-6 and FO-1 and insure that connectors 1W1P2, 1P3, 1P4, 3P1, 1P1, 6P2, and 6P3 are all properly connected.

c. *Main/Auxiliary Receiver Strapping Option.*

The radio set is shipped from the factory strapped for main receiver operation only. When the auxiliary receiver is used, internal strapping on power amplifier module 6A1 must be changed. Figure 1-8 shows a strap

between terminals E3 and E4. This strap should always be checked before the radio set is placed in operation the first time. To check or change the strapping option, proceed as follows:

(1) Set power ON-OFF switch 6A7S1 (figure 1-6) to OFF.

(2) Remove power connector 6P2 from jack 6A7J1 (figure FO-1).

(3) Remove the cover (figure 1-6) from the rt unit.

(4) Disconnect antenna connector 6P3 from jack 6A1J1 (figure FO-1).

(5) Remove five screws and lockwashers from the heat sink end of power amplifier module 6A1 (figure 1-6). Remove the sixth screw and lockwasher located just below jack 6A1J2.

(6) Slide power amplifier module 6A1 toward the open side of the chassis and out of the rt unit.

(7) Place the power amplifier module on a flat working surface with the heat sink side down.

(8) Remove the 12 screws and lockwashers that hold the cover. Remove the cover and refer to figure 1-8.

(9) If the radio set is to be used with only the main receiver, insure that terminals E3 and E4 are strapped as shown in figure 1-8.

(10) If both the main and auxiliary receivers will be used, proceed as follows:

CAUTION

When-soldering use care not to overheat components.

(a) Use a 30-watt soldering iron and remove the strap between terminals E3 and E4 (figure 1-8).

(b) Install a similar strap of bus wire between terminals E3 and E5 and between terminals E4 and E6 (figure 1-8).

(11) Replace the cover on power amplifier module 6A1 and secure it with the 12 screws and lockwashers removed in step (8).

(12) Slide the power amplifier module back into place in the rt unit. Be sure that connector 6ALP1 (figure 1-8) mates properly with connector 6A8W9J2 in the wired chassis (figure 1-7).

(13) Secure the module in the chassis with the six screws and lockwashers removed in step (5).

(14) Replace the cover on the rt unit and connect the power and antenna cables that were disconnected in steps (2), (3), and (4).

d. Dual Monitor Audio Strapping Option. It is possible to connect the out-put of both the main and auxiliary receivers to the same audio amplifier to allow simultaneous monitoring with a single loudspeaker. This connection is done by a strapping option on audio/squelch card 6A5. Before the radio set is placed in operation for the first time, this strapping option should be checked. To check or change this strapping option proceed as follows:

(1) Set power ON-OFF switch 6A7S1 (figure 1-6) to OFF.

(2) Disconnect the power cable from jack 6A7J1 (figure FO-1).

(3) Remove the cover (figure 1-6) from the rt unit.

(4) Remove audio/squelch card 6A5 from the RT-1061/URC-80(V). To do this, grasp the plastic handle of the card in the center and pull the handle so it is bowed in the middle. This action releases the securing tabs at the ends of the handle. Then gently pull the card straight out of the chassis.

(5) Place card A6A5 on a flat work surface and refer to figure 1-12.

(6) If the radio set is to be operated with two loudspeakers, as it is in the AN/URC-80(V)1/3 configurations, the dual monitor audio strap (figure 1-12) should not be installed. If such a strap is already installed, remove it by cutting the wire as close as possible to the solder joints.

(7) If the radio set is to be operated with only one loudspeaker, and there is a requirement to monitor both the main and auxiliary receivers, the dual monitor audio strap should be installed. To install the strap, solder a short piece of insulated bus wire to the two points shown in figure 1-12.

(8) Replace audio/squelch card A6A5 in the chassis. Be sure the component side of the card faces power supply module 6A7.

(9) Replace the cover on the rt unit and connect the power cable to jack 6A7J1.

e. Auxiliary Receiver High-Band/Low-Band Strapping Option. If the AN/URC-80(V)1/3 is to be operated with an auxiliary receiver, the high-band/low-band strapping option on injection oscillator card 6A10 should be checked before the radio set is placed in operation for the first time. To check or change this strapping option, proceed as follows:

(1) Set power ON-OFF switch 6A7S1 (figure 1-6) to OFF.

(2) Remove power connector 6P2 from jack 6A7J1 (figure FO-1).

(3) Remove the cover (figure 1-6) from the rt unit.

(4) Remove injection oscillator card 6A10 from the rt unit. To do this, grasp the plastic handle of the card in the center and pull the handle so it is bowed in the middle. This action releases the securing tabs at the ends of the handle. Then gently pull the card straight out of the chassis.

(5) Place card 6A10 on a flat work surface and refer to figure 1-17.

(6) If the auxiliary receiver will be used to monitor a channel in the high band (160 to 162.5 MHz), a strap must be installed on injection oscillator card 6A10 as shown in figure 1-17. If the auxiliary receiver will be used to monitor a channel in the low band (156 to 157.5 MHz), no strap is required. This strap is not required on the AN/URC-80(V)1/3 configurations.

(7) If a strap is required and none has been installed, solder one to the points indicated in figure 1-17.

(8) If a strap is not required but one has been installed, remove the strap by cutting it as close as possible to each terminal.

f. Presetting Operator Controls. Refer to chapter 3 for instructions pertaining to preset controls.

g. Normal Operating Checks. The normal operating procedures in chapter 3 suffice for these checks.

CHAPTER 3

OPERATING INSTRUCTIONS

Section I. CONTROLS AND INSTRUMENTS

3-1. Damage From Improper Settings

The only restriction on control settings pertains to channel selection. When operating within the continental United States and/or its territorial waters, do not transmit on any of the following unauthorized channels: 01 through 05, 15, and 60 through 64.

3-2. Operator/Crew Controls

Table 3-1 provides a brief function of all the operator's controls and indicators for the AN/URC-80(V)/3. Figure 3-1 shows the location of these except power ON-OFF switch 6A7S1, which is located on the rt unit and shown in figure 1-6.

Table 3-1. Operator's controls

Control, indicator or connector	Function														
XMIT indicator lamp DS2 and DS3 lamps	When lighted, indicates the transmitter circuits are energized Provides illumination for CHANNEL SELECTOR switches S1, S2, and S3.														
CHANNEL SELECTOR switch S1 (6-position rotary switch)	<table border="0"> <thead> <tr> <th>Sw Pos</th> <th>Function</th> </tr> </thead> <tbody> <tr> <td>16</td> <td>Selects transmit and receive operation on international distress, safety, and calling channel 16 (156.800 MHz).</td> </tr> <tr> <td>SELECT</td> <td>Enables CHANNEL SELECTOR switches S2 and S3 so they can select any channel for operation.</td> </tr> <tr> <td>6</td> <td>Selects transmit and receive operation on the intership safety (ship-to-ship) channel 06 (156.300 MHz).</td> </tr> <tr> <td>23</td> <td>Selects transmit and receive operation on channel 23 (157.150 MHz).</td> </tr> <tr> <td>22</td> <td>Selects transmit and receive operation on channel 22 (157.100 MHz).</td> </tr> <tr> <td>W</td> <td>Selects receive-only operation on the weather channel (162.550 MHz).</td> </tr> </tbody> </table>	Sw Pos	Function	16	Selects transmit and receive operation on international distress, safety, and calling channel 16 (156.800 MHz).	SELECT	Enables CHANNEL SELECTOR switches S2 and S3 so they can select any channel for operation.	6	Selects transmit and receive operation on the intership safety (ship-to-ship) channel 06 (156.300 MHz).	23	Selects transmit and receive operation on channel 23 (157.150 MHz).	22	Selects transmit and receive operation on channel 22 (157.100 MHz).	W	Selects receive-only operation on the weather channel (162.550 MHz).
Sw Pos	Function														
16	Selects transmit and receive operation on international distress, safety, and calling channel 16 (156.800 MHz).														
SELECT	Enables CHANNEL SELECTOR switches S2 and S3 so they can select any channel for operation.														
6	Selects transmit and receive operation on the intership safety (ship-to-ship) channel 06 (156.300 MHz).														
23	Selects transmit and receive operation on channel 23 (157.150 MHz).														
22	Selects transmit and receive operation on channel 22 (157.100 MHz).														
W	Selects receive-only operation on the weather channel (162.550 MHz).														
CHANNEL SELECTOR switches S2 and S3 (10- and 12-position rotary switches)	When CHANNEL SELECTOR switch S1 is set to SELECT, the combined settings of switches S2 and S3 select operation on any of the 55 available channels.														
POWER-HIGH-LOW switch	Selects transmitter output power. HIGH position selects 25-watt output power. LOW position selects 1-watt output power.														
MAIN RCVA SQUELCH control	Adjusts main receiver audio output to the handset and the loudspeaker.														
MAIN RCVR VOLUME control	Adjusts the squelch threshold (quieting) point of the main receiver audio circuits														
AUX RCVR VOLUME control	When radio set is equipped with an auxiliary receiver, adjusts the audio output of the auxiliary receiver to the loudspeaker. When the radio set is not equipped with an auxiliary receiver, this control is inoperative.														
AUX RCVR SQUELCH control	When the radio set is equipped with an auxiliary receiver, adjusts the squelch threshold (quieting) of the auxiliary receiver audio circuits. When the radio set is not equipped with an auxiliary receiver, this control is inoperative.														
J1-CONTROL jack (37-pin male connector-receptacle)	Mates with connector P2 of control cable 1W1 to provide interface with the RT-1061/URC-80(V).														
J2-ICS jack (U-79/U connector)	Not used in AN/URC-80(V) 1/3 configurations. May be used to interface the radio set with compatible telephone and intercom equipment.														
SPEAKER J3-MAIN jack (U-183/U connector)	Mates with connector 1P3 for interface with the main receiver loudspeaker.														
SPEAKER J4-AUX jack (U-183/U connector)	Mates with connector 1P4 for interface with the auxiliary receiver loudspeaker.														
HANDSET jack (U-183/U connector)	Mates with connector P1 on Handset H-189/GR.														
Power ON-OFF switch 6A7S1 (fig. 1-7)	ON - position applies power to all operating circuits of the radio set. OFF - position removes power from all operating circuits of the radio set														

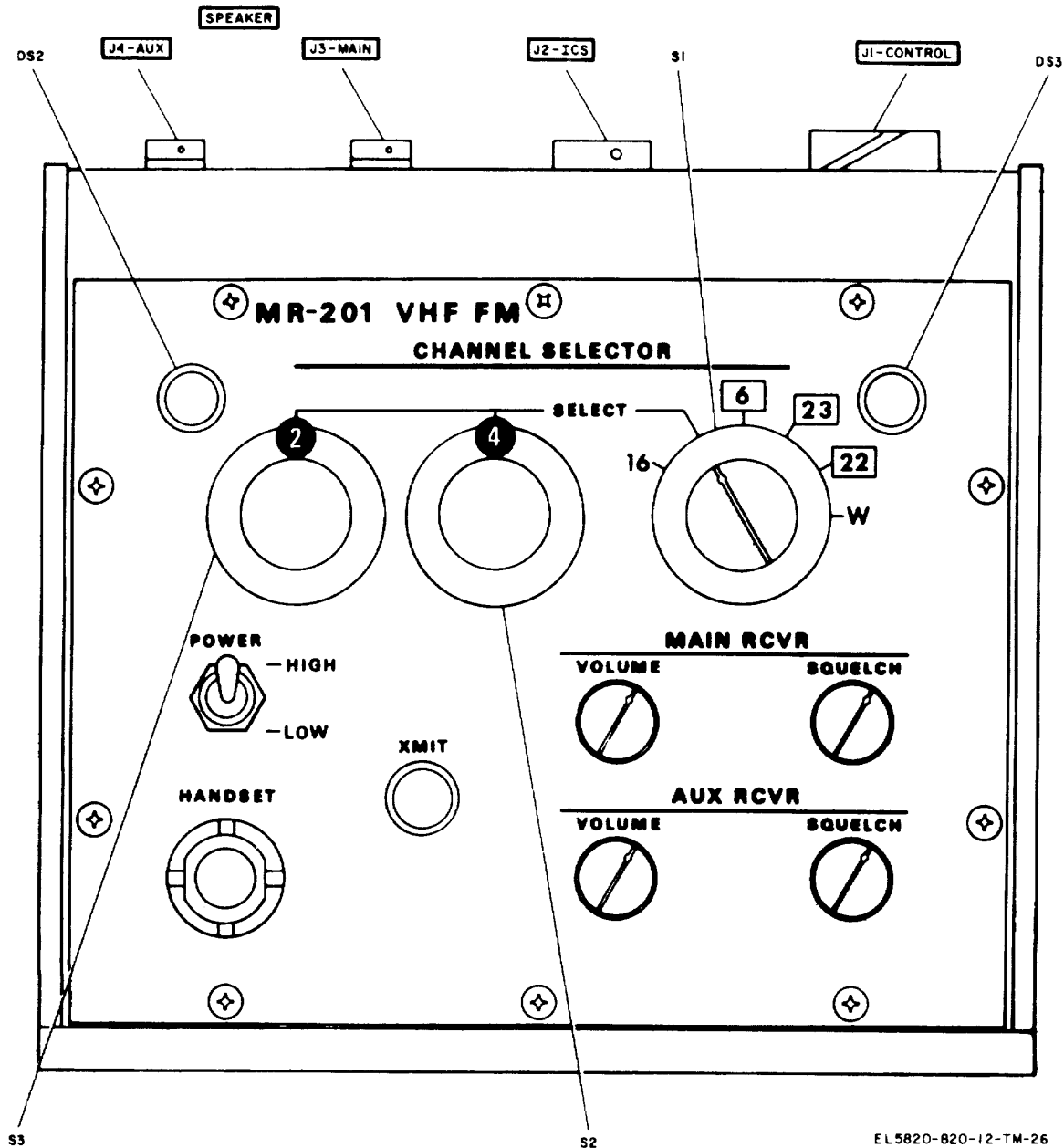


Figure 3-1. Receiver-Transmitter Control C-8981/URC-80[V], controls and indicators.

Section II. OPERATION UNDER USUAL CONDITIONS

3-3. Preliminary Starting Procedures

- a. On Radio Receiver-Transmitter RT-1061/URC-80(V) (figure 1-6), set power ON/OFF switch 6A7S1 to OFF.
- b. On Receiver-Transmitter Control C-8981/URC-80(V), set control as follows:

- (1) CHANNEL SELECTOR switches S2 and S3 to any authorized operating channel.
- (2) CHANNEL SELECTOR switch S1 to SELECT.
- (3) POWER-HIGH-LOW switch to either HIGH or LOW.
- (4) MAIN RCVR VOLUME and SQUELCH controls fully counterclockwise.

(5) AUX RCVR VOLUME and SQUELCH controls fully counterclockwise.

3-4. Initial Adjustments

Before placing the AN/URC-801V)1/3 in operation, make the following visual checks.

- a. Insure that a suitable antenna has been installed and is properly connected.
- b. Check the loudspeaker connections at the loudspeakers and at the control unit.
- c. Remove the cover (figure 1-6) from the rt unit and observe whether the unit is equipped with an auxiliary receiver (i.e., have auxiliary receiver card 6A9 and injection oscillator card 6A10 (figure 1-6) been installed). Replace the cover and secure it with the four latches.

NOTE

If the rt unit is not equipped with an auxiliary receiver, the AUX RCVR VOLUME and SQUELCH controls on the control unit are inoperative.

d. Insure that primary power is connected to jack 6A7J1 (figure 1-6).

3-5. Operating Procedures

CAUTION

Select only channels you are authorized to use. See table 3-2.

- a. Select the desired operating channel. If the desired operating channel is 16, 06, 22, 23, or the weather channel (162.550 MHz), the selection can be made by setting CHANNEL SELECTOR switch S1 (figure 3-1) to the desired channel. When CHANNEL SELECTOR switch S1 is in any position except SELECT, CHANNEL SELECTOR switches S2 and S3 (figure 3-1) are inoperative. The transmit function of the radio set is inhibited when CHANNEL SELECTOR switch S1 is set to W (weather channel 162.550 MHz). All operating channels of the maritime vhf band (table 3-2) may be selected as follows:

Table 3-2. AN/URC-80[V]1/3 operating channels

Channel no.	Frequency (MHz)		Assigned function
	Transmit	Receive	
00	Inhibited	160.600	Not assigned
01	156.050	160.650	Land mobile public safety
02	156.100	160.700	Land mobile public safety
03	156.150	160.750	Land mobile public safety
04	156.200	160.800	Land mobile public safety
05	156.250	160.850	Land mobile public safety
06	156.300	156.300	Intership safety, ship-to- ship
07	156.350	156.350	Commercial ship-to-shore
08	156.400	156.400	Commercial to ships only
09	156.450	156.450	Commercial ship-to-shore and non-commercial to shore only
10	156.500	156.500	Commercial ship-to-shore
11	156.550	156.550	Commercial ship-to-shore
12	156.600	156.600	Port operations ship-to-shore
13	156.650	156.650	Navigational, ship-to-ship and ship-to-shore
14	156.700	156.700	Port operations ship-to-shore
15	156.750	156.750	Environmental conditions, coast station broadcast
16	156.800	156.800	INTERNATIONAL DISTRESS, SAFETY AND CALLING
17	156.850	156.850	State control, ship-to-shore
18	156.900	156.900	Commercial ship-to-shore
19	156.950	156.950	Commercial ship-to-shore
20	157.000	161.600	Port operations, ship-to-shore
21	157.050	157.050	U.S. government stations only
22	157.100	157.100	U.S. government stations only
23	157.150	157.150	U.S. government stations only

Table 3-2. AN/URC-80YV]1/3 operating channels [cont]

Channel no.	Frequency (MHz)		Assigned function
	Transmit	Receive	
24	157.200	161.800	Public correspondence, ship to public coast station
25	157.250	161.850	Public correspondence, ship to public coast station
26	157.300	161.900	Public correspondence, ship to public coast station
27	157.350	161.950	Public correspondence, ship to public coast station
28	157.400	162.00	Public correspondence, ship to public coast station
29	Inhibited	157.450	Not assigned
60	156.025	160.625	Land mobile public safety
61	156.075	160.675	Land mobile public safety
62	156.125	160.725	Land mobile public safety
63	156.175	160.775	Land mobile public safety
64	156.225	160.825	Land mobile public safety
65	156.275	156.275	Port operations, ship-to-shore
66	156.325	156.325	Port operations. ship-to-shore
67	156.375	156.375	Commercial, to ships only
68	156.425	156.425	Noncommercial ship-to-shore
69	156.475	156.475	Noncommercial to shore only
70	156.525	156.525	Noncommercial, to ships only
71	156.575	156.575	Noncommercial to shore only
72	156.625	156.625	Noncommercial to ships only
73	156.675	156.675	Port operations, ship-to-shore
74	156.725	156.725	Port operations, ship-to-shore
75	Inhibited	156.775	Not assigned
76	Inhibited	156.825	Not assigned
77	156.875	156.875	Commercial, to ships only
78	156.925	156.925	Noncommercial, to shore only
79	156.975	156.975	Commercial, ship-to-shore
80	157.025	157.025	Commercial, ship-to-shore
81	157.075	157.075	U.S. government stations only
82	157.125	157.125	U.S. government stations only
83	157.175	157.175	U.S. government stations only
84	157.225	161.825	Public correspondence, ship to public coast station
85	157.275	161.875	Public correspondence, ship to public coast station
86	157.325	161.925	Public correspondence, ship to public coast station
87	157.375	161.975	Public correspondence.

Table 3-2. AN/URC-80[V]1/3 operating channels [cont]

Channel no.	Frequency (MHz)		Assigned function
	Transmit	Receive	
88	157.425	157.425	ship to public coast station
89	Inhibited	157.475	Commercial, ship-to-shore Not assigned

(1) Set CHANNEL SELECTOR switch S1 to SELECT.

(2) Set CHANNEL SELECTOR switches S2 and S3 so that the desired operating channel number is over the black spots of the two switches. *For example:* If channel 24 is selected, the number 2 is visible over the black spot of switch S3 and the number 4 is visible over the black spot of switch S2. See figure 3-1.

b. On the rt unit, set power ON-OFF switch 6A7S1 to ON.

c. Set POWER HIGH-LOW switch S4 to either HIGH or LOW depending upon the power output required. Use the LOW position whenever operating requirements permit. The lower power output will reduce chances of interfering with other stations using the channel.

d. Adjust the MAIN RCVR VOLUME control clockwise until background noise or a signal is audible from the loudspeaker.

e. While no signal is being received (just background noise), adjust the MAIN RCVR SQUELCH control clockwise to a point where the noise cuts out (squelches). Do not adjust the control beyond this point or weak signals may be blocked out.

f. To transmit on the selected operating channel, proceed as follows:

(1) Hold the mouthpiece of the handset approximately one-half inch from your lips.

(2) Press the push-to-talk switch on the handset and observe that the XMIT indicator on the control unit lights. The lighted indicator indicates that the transmitter is operating.

(3) Speak slowly and clearly across the mouthpiece in a normal-to-loud voice.

(4) When the transmission is completed, release the push-to-talk switch.

g. Reception is continuous on the selected operating channel except when the transmitter is keyed. Adjust the MAIN RCVR VOLUME control as required for the desired audio output from the main receiver loudspeaker. This receive condition is also the condition used for standby operation of the AN/URC-80(V)3.

h. If the radio set is an AN/URC-80(V)1 equipped with an auxiliary receiver, the frequency or operating channel of the auxiliary receiver is preset to channel 13 (156.650 MHz) and cannot be changed by the operator. Adjust the AUX RCVR VOLUME control as required for the desired audio output from the auxiliary receiver loudspeaker.

i. To stop or shut down the radio set under any condition, set power ON-OFF switch 6A7S1 (figure 1-6) to OFF.

Section III. OPERATION UNDER UNUSUAL CONDITIONS

3-6. Operation Under Adverse Conditions

a. *Cold Climates.* Extreme cold makes cables, the handset cord, and other rubber or plastic parts stiff and brittle.

(1) Keep the radio set protected as much as possible. Avoid removing connectors or bending cables unnecessarily.

(2) Be especially careful when handling the handset to avoid cracking the plastic.

(3) Insure that the cover on the RT-1061/URC-80(V) is in place and properly secured with the four latches.

b. *Sandy, Hot, Dry Climates.* Sandy, hot, dry climates expose the radio set to damage from sand, dust, and strong sunlight.

(1) Protect the radio set from sand, dust, and strong sunlight. Clean and dust each of the units frequently.

(2) When the radio set is not in use, be sure to keep the cover on the RT-1061/URC-80(V) in place and secured. If necessary, install protective covers on the units that are exposed to severe elements.

c. *Warm Damp Climates.* Warm damp climates expose the radio set to damage from moisture and fungus. Use a lint-free cloth and wipe all moisture or fungus from the exterior of the units frequently.

d. *Salt Air Environments.* Salt air environments expose the radio set to damage from

salt spray or rust from salt air. For cleaning procedures, refer to preventive maintenance checks and services in paragraph 4-3.

3-7. Emergency Operation

a. Primary Power Failure. In the event of a primary power failure, it may be necessary to change the type of primary power used or to operate the radio set on a 12 or 24-volt battery supply. To do this, changes to the strapping on power supply 6A7 are required. Refer to paragraph 2-7e for procedures.

b. Main Receiver Failure. If the radio set is an AN/URC-80(V)1 equipped with an auxiliary receiver and there is a failure in the main receiver, operation may be restored as follows:

(1) On the rt unit, set power ON-OFF switch 6A7S1 (figure 1-6) to OFF.

(2) Disconnect power connector 6P2 (figure FO-1) from the rt unit.

(3) Remove the cover from the rt unit.

(4) Remove receiver card 6A6 and auxiliary receiver card 6A9 from the rt unit (figure 1-6).

(5) Install auxiliary receiver card 6A9 in main receiver position 6A6. Send the faulty main receiver card for repair.

(6) Replace the cover on the rt unit and return to normal operation. It should be noted that normal operation will not include use of the auxiliary receiver.

**CHAPTER 4
MAINTENANCE INSTRUCTIONS**

Section I. OPERATOR/CREW MAINTENANCE INSTRUCTIONS

4-1. Scope of Operator/Crew and-Organizational Maintenance

NOTE

Refer to TM 750-244-2 for proper procedures for destruction of this equipment to prevent enemy use.

a. Operator/crew preventive maintenance is the systematic care, servicing and inspection of equipment to prevent the occurrence of trouble, to reduce downtime, and to maintain equipment in serviceable condition. To be sure that your Radio Set is always ready for your mission, you must do scheduled preventive maintenance checks and services (PMCS).

(1) BEFORE OPERATION, perform your B PMCS to be sure that your equipment is ready to go.

(2) WEEKLY PMCS are important checks to keep serious problems from suddenly happening. Perform WEEKLY as well as BEFORE OPERATION PMCS if:

(a) You are the assigned operator and have not operated the item since the last WEEKLY.

(b) You are operating the item for the first time.

(3) When an item of equipment is reinstalled after removal, for any reason, perform the necessary B PMCS to be sure the item meets the readiness reporting criteria.

(4) Use the ITEM NO. column in the PMCS table to get the number to be used in the TM ITEM NO. column on DA Form 2404 (Equipment Inspection and Maintenance Worksheet) when you fill out the form.

b. Routine checks like CLEANING, PRESERVATION, DUSTING, WASHING, CHECKING FOR FRAYED CABLES, STOWING ITEMS NOT IN USE, COVERING UNUSED RECEPTACLES, CHECKING FOR LOOSE NUTS AND BOLTS AND CHECKING FOR COMPLETENESS are not listed as PMCS checks. They are things that you should do any time you see they must be done. If you find a routine check like one of those listed in your PMCS, it is because other operators reported problems with this item.

NOTE

When you are doing any PMCS or routine checks, keep in mind the warnings and cautions.

WARNING

- **Never operate the generator or shelter until it has been properly grounded. Electrical defects in the load lines or equipment can cause**

death by electrocution when contact is made with an ungrounded system.

- **Adequate ventilation should be provided while using TRICHLOROTRIFLUOROETHANE. Prolonged breathing of vapor should be avoided. The solvent should not be used near heat or open flame; the products of decomposition are toxic and irritating. Since TRICHLOROTRIFLUOROETHANE dissolves natural oils, prolonged contact with skin should be avoided. When necessary, use gloves which the solvent cannot penetrate. If the solvent is taken internally, consult a physician immediately.**
- **Compressed air shall not be used for cleaning purposes except where reduced to less than 29 pounds per square inch (psi) and then only with effective chip guarding and personnel protective equipment. Do not use compressed air to dry parts when TRICHLOROTRIFLUOROETHANE has been used. Compressed air is dangerous and can cause serious bodily harm if protective means or methods are not observed to prevent chip or particle (of whatever size) from being blown into the eyes or unbroken skin of the operator or other personnel.**

NOTE

The PROCEDURES column in your PMCS chart instructs how to perform the required checks and services. Carefully follow these instructions and, if tools are needed or the chart so instructs, get organizational maintenance to do the necessary work.

If your equipment must be in operation all the time, check those items that can be checked and serviced without disturbing operation. Make the complete checks and services when the equipment can be shut down.

c. Deficiencies that cannot be corrected must be reported to higher category maintenance personnel. Records and reports of preventive maintenance must be made in accordance with procedures given in DA Pam 738-750.

- a. You are the assigned operator and have not operated the item since the last weekly.
- b. You are operating the item for the first time.

4-2. Operator/Crew Preventive Maintenance Checks and Services

Perform weekly as well as before operation PMCS if:

NOTE

The checks in the interval column are to be performed in the order listed.

4-3. Operator/Crew Preventive Maintenance Checks and Services Chart

B - Before W - Weekly
Table 4 - 1. Operator/crew preventive maintenance checks and services

Item No.	Interval		Item To Be Inspected	Procedures-Checks for and have repaired or adjusted as necessary	Equipment is not Ready/Available If:
	B	W			
1.	*		RECEIVER-TRANSMITTER CONTROL C-8981/URC-80V	Operational check	
2.	*	*	RADIO RECEIVER-TRANSMITTER RT-1061/URC-80(V)	Ensure that indicators DS2 and DS3 (fig. 3-1) light when power switch 6A7S1 (fig. 1-6) is set to ON. Ensure that the XMIT indicator (fig. 3-1) lights when the PUSH TO TALK switch is pressed and the transmitter is keyed.	
3.	*		HANDSET H-189/GR	Operational check.	

4-4. Troubleshooting

Troubleshooting at the operator/crew level consists primarily of following the operating instructions in

chapter 3, observing any abnormal conditions, and reporting them to the maintenance supervisor for correction.

Section II. ORGANIZATIONAL MAINTENANCE INSTRUCTIONS

4-5. Tools and Test Equipment

Repair parts, tools, test equipment, and accessories issued with or authorized for use by organizational maintenance activities for maintenance of Radio Set AN/URC-80(V)1/3 are listed in the Maintenance Allocation Chart, appendix B of this manual.

4-6. Repainting and Refinishing Instructions.

When it becomes necessary to repaint or retouch the exterior surfaces of any of the units of the radio set, use #213 gray textured epoxy (CPN 005-1357-010). For instructions and painting procedures, refer to TB-746-10, Field Instructions for Painting and Preserving Electronic Command Equipment. Instructions on the care of painting equipment are contained in TM 9-213, Painting Instructions for Field Use.

CAUTION

Do not paint any surfaces that were not originally painted. These include

the interior of the rt unit and the control unit. Also keep paint off connectors, jacks, and controls.

4-7. Preventive Maintenance Checks and Services

The preventive maintenance checks and services authorized at the organizational maintenance level are the same as the weekly checks and services described for the operator/crew in table 4-1. Organizational maintenance will perform these checks monthly.

4-8. Organizational Troubleshooting

The troubleshooting chart presented in table 4-2 is a guide for isolating a trouble to a faulty unit. Items listed in the "Probable cause" column are presented in the order of failure probability. Follow the instructions in the "Corrective action" column and perform only that maintenance authorized at the organizational level. Refer to the Maintenance Allocation Chart, appendix B of this manual.

Table 4-2. Organizational troubleshooting

Malfunction	Probable cause	Corrective action
1. Loss of power.	a. Fuse blown. b. Power supply 6A7 (fig. 1-61) faulty. c. Faulty power cable.	a. Replace fuse. Refer to paragraph 4-9a for procedures b. Replace rt unit. c. Refer to figure FO-1, and disconnect power connector 6P2 from the rt unit. Use a vom and measure the input voltage at connector 6P2.
2. Radio set will not transmit or receive	a. Faulty cards or modules in rt unit. b. Faulty control unit. c. Control cable 1W1 faulty.	a. Replace rt unit. b. Replace control unit. c. Disconnect control cable 1W1 from the rt unit and from the control unit. Refer to figure FO-1 and perform a pin for pin continuity check of the cable with a vom
3. Radio set will transmit but will not receive.	a. Faulty cards or modules in rt unit. b. Faulty wiring between control unit and main receiver loudspeaker. c. Faulty loudspeaker.	a. Replace rt unit. b. Refer to figure FO-1. At the control unit, disconnect main receiver loudspeaker connector 1P3 from the control unit. Use a vom and check the continuity between pin A of connector 1P3 and terminal 1 on the main receiver loudspeaker. Then check between pin E of connector 1P3 and terminal 2 of the loudspeaker. c. Teat and/or replace loudspeaker. Refer to paragraph 4-9b for procedures

Table 4-2. Organizational troubleshooting [cont]

Malfunction	Probable cause	Corrective action
4. Radio set will receive but will not transmit.	<ul style="list-style-type: none"> a. Faulty power amplifier module in rt unit. b. Faulty handset. c. Faulty control unit. d. Control cable 1W1 faulty. 	<ul style="list-style-type: none"> a. Replace rt unit. b. Test and/or replace handset. Refer to paragraph 4-9c for procedures. c. Replace control unit. d. Perform continuity check as described in step 2c above.
5. Power output of radio set cannot be changed from high to low or from low to high.	<ul style="list-style-type: none"> a. Replace rt unit. b. Replace control unit. c. Perform continuity check as 	<ul style="list-style-type: none"> a. Faulty rt unit. b. Faulty control unit. c. Control cable 1W1 faulty. described in step 2c above.
6. Radio set does not shift frequency between transmit and receive on specified channels. (see table 3-2)	<ul style="list-style-type: none"> a. Faulty rt unit. b. Faulty control unit. c. Control cable 1W1 faulty. 	<ul style="list-style-type: none"> a. Replace rt unit. b. Replace control unit. c. Perform continuity check as described in step 2c above.
7. No control over receiver squelch.	<ul style="list-style-type: none"> a. Replace rt unit. b. Faulty control unit. c. Control cable 1W1 faulty. 	<ul style="list-style-type: none"> a. Faulty rt unit. b. Replace control unit. c. Perform continuity check as described in step 2c above.
8. No control over receiver volume.	<ul style="list-style-type: none"> a. Replace rt unit. b. Faulty control unit. c. Control cable 1W1 faulty. 	<ul style="list-style-type: none"> a. Faulty rt unit. b. Replace control unit. c. Perform continuity check as described in step 2c above.
9. Unable to change channels.	<ul style="list-style-type: none"> a. Faulty rt unit. b. Faulty control unit. c. Control cable 1W1 faulty. 	<ul style="list-style-type: none"> a. Replace rt unit. b. Replace control unit. c. Perform continuity check as described in step 2c above.
10. No reception on auxiliary receiver. (Applicable to AN/URC-80(V)1 only)	<ul style="list-style-type: none"> a. Faulty cards in rt unit. b. Faulty control unit. c. Faulty wiring between unit and auxiliary receiver loudspeaker. d. Faulty loudspeaker e. Control cable 1W1 faulty. 	<ul style="list-style-type: none"> a. Replace rt unit. b. Replace control unit. c. Refer to figure FO-1. At the control unit, disconnect auxiliary receiver loudspeaker connector 1P4 from the control unit. Use a vom and check the continuity between pin A of connector 1P4 and terminal 1 on the auxiliary receiver loudspeaker. Then check between pin E of connector 1P4 and terminal 2 of the loudspeaker. d. Test and/or replace loudspeaker. Refer to paragraph 4-9b for procedures. e. Perform continuity check as described in step 2c above.

4-9. Maintenance of Radio Set

a. Fuse Replacement.

(1) To replace fuses in the rt unit, proceed as follows:

(a) Release the four latches and remove the cover (figure 1-6) from the rt unit.

WARNING

High voltages dangerous to life, exist in the power supply even when power switch 6A7S1 (figure 1-6) is set to OFF. Power connector 6P2 must be disconnected from the rt unit before a fuse is replaced.

(b) Set power ON/OFF switch 6A7S1 (figure 1-6) to OFF and disconnect connector 6P2 from the rt unit.

NOTE

If the radio set is equipped with an auxiliary receiver, auxiliary receiver card 6A9 and injection oscillator card 6A10 (figure 1-6) should be removed to afford better access to the fuses. To 4-4 remove the cards, grasp the plastic handle on the card so that it is bowed in the middle. This action releases the securing tabs on the ends of the handle. Then pull the handle until the card moves straight up and out of the chassis.

(c) Use a Phillips no. 1, 1-inch blade screwdriver and remove the screw, flat washer, and lockwasher that hold the fuse cover in place (figure 2-10). Remove the fuse cover by sliding it upward.

(d) Refer to figure 2-11 and remove fuses F1, F2, and F3.

(e) Use a vom to check each of the fuses.

(f) Replace the fuses with known good fuses as listed in table 2-3.

(g) Slide the fuse cover in place and secure it with the screw, flat washer, and lockwasher removed in step (c).

NOTE

If auxiliary receiver card 6A9 and injection oscillator card 6A10 were removed to gain access to the fuses, replace these cards. To do this, orient each card so that the component side faces toward power supply 6A7 (figure 1-6). Then align the card in the card guides on the chassis and carefully slide the card into position. Continue to push on the plastic handle of the card until the securing tabs at the ends of the handle snap into place.

(h) Replace the cover (figure 1-6) on the rt unit, and secure it with the four latches.

(i) Connect power connector P2 to the rt unit and set power ON/OFF switch 6A7S1 (figure 1-6) as required.

(2) To replace the fuse in the control unit, proceed as follows:

(a) On the rt unit, set power ON/OFF switch to OFF.

(b) Disconnect control cable 1W1 from jack J1-CONTROL on the control unit (figure 1-3).

(c) Remove the 10 screws and washers that hold the front panel of the control unit in place.

(d) Carefully lift the front cover to the position shown in figure 2-14. Do not remove the gasket that fits into the groove at the top edge of the control unit housing.

(e) Use a vom to check fuse F1 (figure 2-14). If the fuse is open, proceed to step (f); if the fuse is good, proceed to step (g).

(f) Use a low-wattage (30 watts or less) soldering iron to remove fuse F1 (figure 2-14). Replace the fuse with a known good fuse as listed in table 2-3.

(g) Insure that the gasket (figure 2-14) is properly seated in the groove at the top edge of the control unit housing. Then replace the front panel.

Secure it with the 10 screws and washers removed in step (c).

(h) Connect control cable 1W1 to jack J1-CONTROL on the control unit.

(i) Return the radio set to normal operation.

b. Loudspeaker Test and Replacement. To remove and test a loudspeaker proceed as follows:

(1) Use a low-wattage soldering iron (30 watts or less) and unsolder the connections to terminals 1 and 2 (figure 2-3). Slide the wires out of the terminals.

(2) Use a vom and measure the resistance between terminals 1 and 2 on the loudspeaker. A reading of 16 5 ohms should be obtained. Also note a slight crackling sound from the loudspeaker as the vom is connected and disconnected.

(3) If the resistance measurements are out of tolerance, replace the loudspeaker with a serviceable unit.

(4) To install the new loudspeaker, proceed as follows:

(a) Insure that approximately 0.5-inch of insulation is removed from the end of each of the two wires to be connected.

(b) Use a low-wattage soldering iron (30 watts or less) and tin the ends of each wire.

(c) Observe the wiring in figure FO-1 and slide the tinned ends of the wire in terminals 1 and 2 of the loudspeaker. If necessary, bend the terminals slightly to hold the wires in place.

(d) Use care not to overheat the terminals, and solder the wires to the terminals.

c. Handset Test and Replacement. To test the handset perform the following steps. For more detailed maintenance instructions on the handset, refer to TM 11-5965-280-15.

(1) Disconnect connector 3P1 (figure FO-1) from the control unit.

(2) Use a vom and measure the resistance between pins A and B of connector 3P1. A reading of 1000 +250 ohms should be obtained.

(3) Hold the push-to-talk (ptt) switch on the handset depressed. Measure the resistance between pins A and C of connector 3P1. A reading of not more than 5 ohms should be obtained.

(4) Release the ptt switch. Measure the resistance between pins A and C of connector 3P1. A reading of not less than 1 megohm should be obtained.

(5) Hold the ptt switch depressed and measure the resistance between pins A and D of connector 3P1. A reading of 150 +30 ohms should be obtained.

(6) Release the ptt switch and measure the resistance between pins A and D. A reading of not less than 1 megohm should be obtained.

(7) If the readings observed in steps (2) through (6) are out of tolerance, the handset must be repaired or replaced. For repair instructions, refer to TM 11-5965-280-15.

d. Indicator Lamp Replacement. To replace indicator lamps DS1, DS2, and XMIT (figure 1-3) on the control panel, proceed as follows:

(1) On the rt unit, set power ON/OFF switch to OFF.

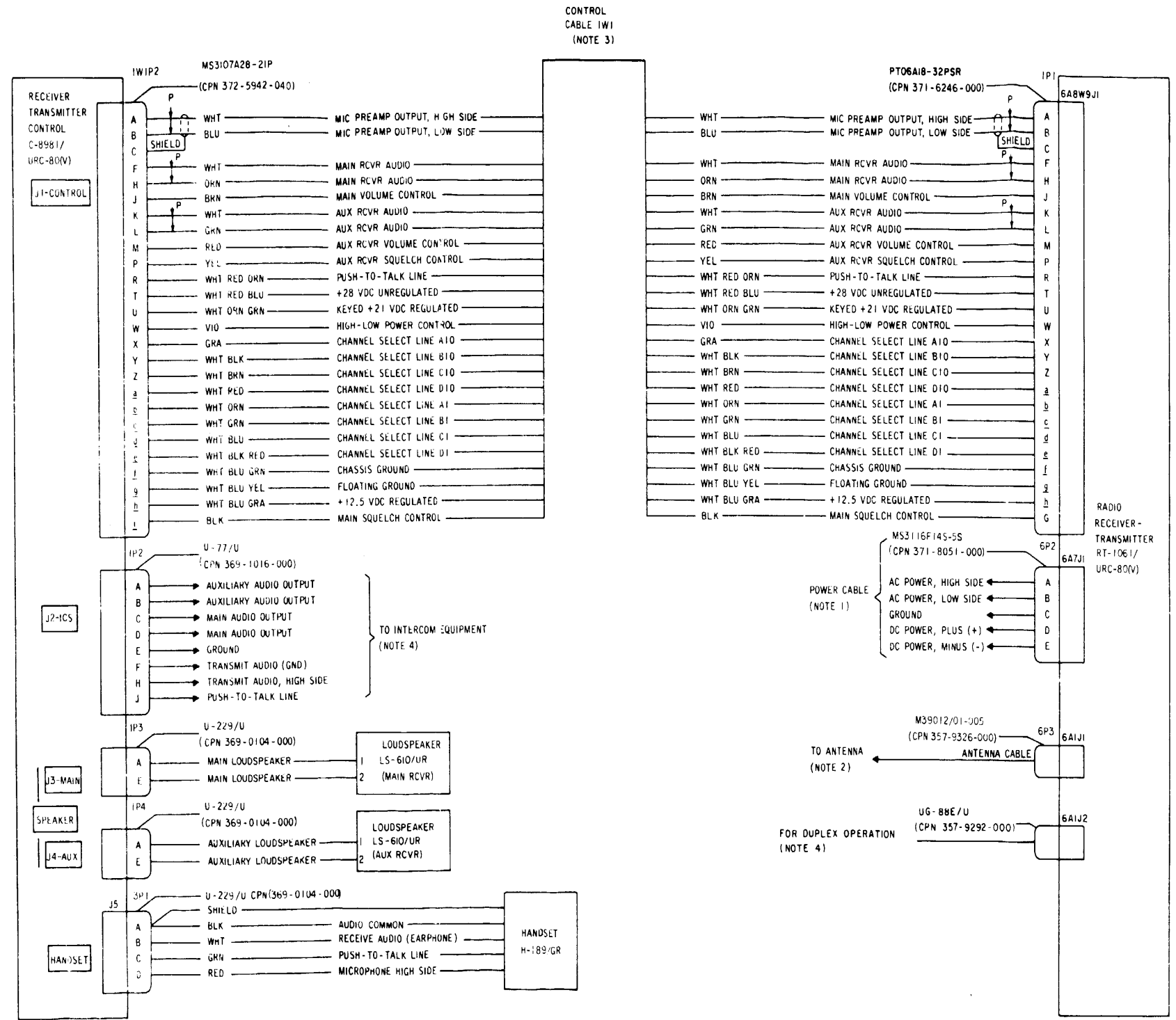
(2) Grasp the indicator lens with a thumb and forefinger and unscrew it from the front panel. Do not

remove the waterproof gasket from the threaded part of the lens.

(3) Remove the incandescent lamp from the lens. Replace it with a new lamp (MS180209-387).

(4) Screw the lens into the front panel making sure that the waterproof gasket seats properly as the lens is tightened. Tighten fingertight.

(5) On the rt unit set power ON/OFF switch to ON. Indicators DS1 and DS2 (figure 1-3) should light. Select an operating channel and key the transmitter momentarily. The XMIT indicator on the control panel should light when the transmitter is keyed.



NOTES:

- | WIRE SIZE | MAXIMUM POWER CABLE LENGTH | | | |
|-----------|----------------------------|---------------|---------------|---------------|
| | 12 VDC | 24 VDC | 32 VDC | 115 / 230 VAC |
| 18 AWG | * | * | * | 40 FT (12.2M) |
| 16 AWG | 5 FT (1.52M) | 15 FT (4.7M) | 25 FT (7.62M) | 75 FT (22.8M) |
| 12 AWG | 10 FT (3.04M) | 30 FT (9.15M) | 40 FT (12.2M) | 75 FT (22.8M) |
| 4 AWG | 40 FT (12.2M) | 75 FT (22.8M) | 75 FT (22.8M) | 75 FT (22.8M) |

* DO NOT USE
- FOR SHORT CABLE RUNS, RG-58 OR RG-223 COAXIAL CABLE MAY BE USED IF A UG-536/BU CONNECTOR IS SUBSTITUTED FOR THE M39012/01-005 (CPN 357-9326-000) CONNECTOR FURNISHED IN THE CABLE ASSY KIT. FOR LONG CABLE RUNS, USE RG-213 COAXIAL CABLE AND THE CONNECTOR FURNISHED.

FREQUENCY	CABLE	LOSS PER 100 FEET (30.48M)
200 MHZ	RG-58	7.4 DB
200 MHZ	RG-223	7.0 DB
200 MHZ	RG-213	2.7 DB

- CONTROL CABLE IW1 IS 25 FEET LONG BUT MAY BE CUT TO THE EXACT LENGTH REQUIRED FOR A PARTICULAR INSTALLATION BEFORE CONNECTOR IP1 IS INSTALLED.
- NOT USED IN AN/URC-80[V]1/3 CONFIGURATION.

ELP20-R20 12-TM-7

Figure FO-1. AN/URC-80[V]1/3 interconnection diagram.

APPENDIX A

REFERENCES

DA Pam 310-1	Consolidated Index of Army Publications and Blank Forms.
DA Pam 738-750	The Army Maintenance Management System (TAMMS).
SB 700-20-1	List of Reportable Items; Army Equipment Status Reporting System.
TB 43-0118	Field Instructions for Painting and Preserving Electronics Equipment, Including Camouflage Painting of Electronic Equipment Shelters.
TM 11-5965-280-15	Operator, Organizational, DS, GS, and Depot Maintenance Manual Including Repair Parts and Special Tools List Handset H-189/GR.
TM 43-0139	Painting Instructions for Field Use.
TM 740-90-1	Administrative Storage of Equipment.
TM 750-244-2	Procedures for Destruction of Electronics Materiel to Prevent Enemy Use (Electronics Command)

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APPENDIX B

MAINTENANCE ALLOCATION

Section I. INTRODUCTION

B-1. General.

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

B-2. Maintenance Functions.

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, preserve, drain, paint, or to replenish fuel/lubricants/hydraulic fluids or compressed air supplies.

d. Adjust. 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 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 equipment used in precision measurement. Consists of the comparison 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/system.

h. Replace. The act of substituting a serviceable like-type part, subassembly, module (component or assembly) in a manner to allow the proper functioning of an equipment/system.

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/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 (e.g., DMWR) in pertinent technical manuals. 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 equipment/components.

l. Symbols. The uppercase letter placed in the appropriate column indicates the lowest level at which that particular maintenance function is to be performed.

B-3. Explanation of Format.

a. Group Number. Not applicable.

b. Functional Group. Column 2 lists the next higher assembly group and the item names of components, assemblies, subassemblies and modules within the group for which maintenance is authorized.

c. Maintenance Functions. Column 3 lists the twelve maintenance functions defined in B-2. Each maintenance function required for an item is specified by the symbol among those listed in d below which indicates the level responsible for the required maintenance. Under this symbol is listed an appropriate work measurement time value determined as indicated in e below.

d. *Use of Symbols.* The following symbols are used to prescribe work function responsibility:

- C - Operator/Crew
- O - Organization
- F - Direct Support
- H - General Support
- D - Depot

e. *Work Measurement Time.* The active repair time required to perform the maintenance function is included directly below the symbol identifying the category of maintenance. The skill levels used to obtain the measurement times approximate those found in typical TOE units. Active repair time is the average aggregate time required to restore an item (subassembly, assembly, component, module, end item, or system) to a serviceable condition under typical field operating conditions. This time includes preparation time, fault isolation/diagnostic time, and QA/QC time in addition to the time required to perform specific maintenance functions identified for the tasks authorized in the maintenance allocation chart. This time is expressed in man-hours and carried to one decimal place (tenths of hours).

f. *Tools and Test Equipment.* This column is used to specify, by code, those tools and test equipment required to perform the designated function .

g. *Remarks.* Self-explanatory.

B-4. Explanation of Format of Table I, Tool and Test Equipment Requirements.

The column in Table I, Tool and, Test Equipment Requirements are as follows:

a. *Tools and Equipment.* The numbers in this column coincide with the numbers used in the tools and equipment column of the applicable tool for the maintenance function.

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

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

d. *Federal Stock Number.* This column lists the Federal stock number of the specific tool or test equipment.

e. *Tool Number.* Not used.

SECTION II. MAINTENANCE ALLOCATION CHART

(1) G R O U P N U M B E R	(2) FUNCTIONAL GROUP COMPONENT ASSEMBLY NOMENCLATURE T	(3) MAINTENANCE FUNCTIONS										(4) TOOLS AND EQUIPMENT	(5) REMARKS	
		I N S P E C T	T E S T	S E R V I C E	A D J U S T	A L I G N	C A L I B R A T E	I N S T A L L	R E P L A C E	R E P A I R	O V E R H A U L			R E B U I L D
	RADIO SET AN/URC-80(V)3 (FSN 5820-097-0082)	C 0.2		C 0.2									1,2	Inspect external surfaces for security of mounting and evidence of deterioration; clean. Continuity tests. Tighten loose components. Replace knobs, fuses & indicator lamps. Tighten loose parts. Visual inspection of interior. Replace handset & speaker. Voltage and resistance tests, repair and/or replace cables. Replace hard wired components. Replace printed modules. All repairs exclusive of major overhaul. All repairs, including rebuild of printed circuit boards. Inspect external surfaces for cleanliness, security of mounting, & evidence of deterioration; clear Continuity & voltage measurements. Replace knobs, fuses, indicator lamps, & connecting cables. Visual inspection of interior. Perform operational tests to determine the need for major adjustments. Test & repair cables & hard wired components. All tests exclusive of complete overhaul. Replace faulty components. All repairs exclusive of rebuild of printed circuit boards. All repairs including rebuild of printed circuit modules.
		0 0.1	0 0.2						0 0.1				3 thru 8	
			F 0.3					F 0.2	F 0.3				1 thru 9	
									D 1.2		D 2.0			
	RECEIV-TRANSMITIE CONTHROL C-8981/URC-80(V)3 (FSN 5820-164-2146, COLLINS 972-6532-001)	C 0.1		C 0.2									1,2	
		0 0.1	0 0.2					0 0.2					3 thru 8	
			F 0.1		F 0.2			F 0.3	F 0.3				1 thru 9	
									D 1.2		D 2.0			

SECTION II. MAINTENANCE ALLOCATION CHART

(1) G R O U P N U M B E R	(2) FUNCTIONAL GROUP COMPONENT ASSEMBLY NOMENCLATURE T	(3) MAINTENANCE FUNCTIONS										(4) TOOLS AND EQUIPMENT	(5) REMARKS				
		I N S P E C T	T E S T	S E R V I C E	A D J U S T	A L I G N	C A L I B R A T E	I N S T A L L	R E P L A C E	R E P A I R	O V E R H A U L			R E B U I L D			
	HANDSET H-189/GR (FSN 5965 069-8886, COLLINS 792-6534-001)	C 0.1		C 0.1													Inspect for cleanliness, security of mounting. Evidence of body & cable deterioration. Clean if necessary. Perform continuity & resistance tests. Replace if necessary. Rebuild & return to user.
	LOUDSPEAKER LS-610/URC-80(V)3 (COLLINS 792-6528-001)		0 0.2 D 0.5 C 0.1										D 0.5 D 1.5		D 1.5		Inspect for cleanliness, security of mounting & evidence of body & cable deterioration. Perform continuity & resistance tests. Replace if necessary. Rebuild & return to user.
	RECEIVER-TRANSMITTER RT-1061/URC-80(V)3 (FSN 5820-110-8617, COLLINS 758-5153-002)	C 0.1	0 0.2	C 0.2									D 1.5		D 2.0	1 thru 9	Inspect external surfaces for cleanliness, security of mounting, & evidence of deterioration; clean. Visual inspection of interior. Continuity & voltage tests of power supply & connecting cables. Perform operational tests to determine the need for major adjustments. All tests exclusive of complete overhaul. Test & repair connecting cables, antenna & power supply. Replace faulty components & printed circuit boards. Return defective PCB6 to depot.
		0 0.1	0 0.2														1,2
				F 0.3													3 thru 8

SECTION II. MAINTENANCE ALLOCATION CHART

(1) G R O U P N U M B E R	(2) FUNCTIONAL GROUP COMPONENT ASSEMBLY NOMENCLATURE T	(3) MAINTENANCE FUNCTIONS										(4) TOOLS AND EQUIPMENT	(5) REMARKS		
		I N S P E C T	T E S T	S E R V I C E	A D J U S T	A L I G N	C A L I B R A T E	I N S T A L L	R E P L A C E	R E P A I R	O V E R H A U L			R E B U I L D	
	MODULE A1 POWER AMPLIFIER		F 0.2									D 1.2	D 2.0	1 thru 9	All tests & repairs exclusive of rebuild of printed circuit boards.
	MODULE A2 TCXO MUTIPLIER MODULE (FSN 5820-009-3325, COLLINS 793-9314-001)		D 0.5									D 0.5	D 1.5	1 thru 9	All repairs, including rebuild of printed circuit boards.
	MODULE A3 MDER VARIABLE DIVIDER (FSN 5820-009-8189, COLLINS 793-9388-002)		D 0.5									D 0.5	D 1.5	1 thru 9	Performance of operational tests to determine the need for adjustment or replacement of faulty modules. Adjust or replace as applicable. Evacuate defective module to depot for repair. Test, repair, and/or rebuild & return to user.
			D 0.5									D 0.5	D 1.5	1 thru 9	Perform operational tests to determine need for adjustment, or replacement of faulty module, adjust or replace as applicable. Evacuate defective module to depot. Perform test to identify faulty component. Replace faulty component. Rebuild if necessary.
			D 0.5									D 0.5	D 1.5	1 thru 9	Perform operational tests to determine need for adjustment, or replacement of faulty module, adjust or replace as applicable. Evacuate defective module to depot. Perform test to identify faulty component. Replace faulty component. Rebuild if necessary.

SECTION II. MAINTENANCE ALLOCATION CHART

(1) G R O U P N U M B E R	(2) FUNCTIONAL GROUP COMPONENT ASSEMBLY NOMENCLATURE T	(3) MAINTENANCE FUNCTIONS										(4) TOOLS AND EQUIPMENT	(5) REMARKS	
		I N S P E C T	T E S T	S E R V I C E	A D J U S T	A L I G N	C A L I B R A T E	I N S T A L L	R E P L A C E	R E P A I R	O V E R H A U L			R E B U I L D
	MODULE A4 VCO (FSN 5820-009-3326, COLLINS 793-9307-001)		D 0.5						F 0.2				3 thru 8	Perform operational tests to determine need for adjustment, or replacement of faulty module, adjust or replace as applicable. Return defective module to depot. Perform test to identify faulty component. Replace faulty component. Rebuild if necessary.
	MODULE A5 AUDIO SQUELCH CARD (FSN 5820-009-3327, COLLINS 793-9295-001)		D 0.5							F 0.3			3 thru 8	Perform operational tests to determine need for adjustment, or replacement of faulty module, adjust or replace as applicable. Return defective unit to depot. Perform test to identify faulty component. Replace faulty component. Rebuild if necessary.
	MODULE A6 RECEIVER CARD (FSN 5820-184-8376, COLLINS 793-9325-004)		D 0.5						F 0.2				3 thru 8	Perform operational tests to determine need for adjustment, or replacement of faulty module, adjust or replace as applicable. Return defective module to depot. Perform test to identify faulty component. Replace faulty component. Rebuild if necessary.
	MODULE A7 POWER SUPPLY		F 0.2						F 0.2	F 0.3			3 thru 8	Perform operational tests to determine need for adjustment, or replacement of faulty module or submodules, adjust or replace as applicable. Return defective unit to depot.

SECTION II. MAINTENANCE ALLOCATION CHART

(1) G R O U P N U M B E R	(2) FUNCTIONAL GROUP COMPONENT ASSEMBLY NOMENCLATURE T	(3) MAINTENANCE FUNCTIONS										(4) TOOLS AND EQUIPMENT	(5) REMARKS	
		I N S P E C T	T E S T	S E R V I C E	A D J U S T	A L I G N	C A L I B R A T E	I N S T A L L	R E P L A C E	R E P A I R	O V E R H A U L			R E B U I L D
	MODULE A7A1 INVERT CARD (COLLINS 793-9339-001, FSN PENDING)		D 0.5						F 0.2	D 0.5		D 1.5	3 thru 8	Perform test to identify faulty component. Replace faulty component. Rebuild if necessary.
	MODULE A7A2 REGULATOR CARD (COLLINS 793-9338-001, FSN PEDWING)		D 0.5						F 0.2	D 0.5		D 1.5	3 thru 8	Perform operational tests to determine need for adjustment or replacement of faulty module, adjust or replace as applicable. Return defective units to depot.
	W/RED CHASSIS A8		D 0.5						F 0.2	D 0.5		D 1.5	3 thru 8	Perform test to identify faulty component. Replace faulty component. Rebuild if necessary.
			D 0.5							D 0.5		D 1.5		Perform operational tests to determine need for adjustment, or replacement of faulty module, adjust or replace as applicable. Return defective units to depot. Perform test to identify faulty component. Replace faulty component. Rebuild if necessary.

SECTION II. MAINTENANCE ALLOCATION CHART

(1) G R O U P N U M B E R	(2) F U N C T I O N A L G R O U P C O M P O N E N T A S S E M B L Y N O M E N C L A T U R E	(3) M A I N T E N A N C E F U N C T I O N S										(4) T O O L S A N D E Q U I P M E N T	(5) R E M A R K S	
		I N S P E C T	T E S T	S E R V I C E	A D J U S T	A L I G N	C A L I B R A T E	I N S T A L L	R E P L A C E	R E P A I R	O V E R H A U L			R E B U I L D
	T													
	MODULE A9 AUX RECEIVER CRD		D 0.5						F 0.2				3 thru 8	Perform operational tests to determine need for adjustment, or replacement of faulty module, adjust or replace as applicable. Return defective units to depot. Perform test to identify faulty component. Replace faulty component. Rebuild if necessary.
	MODULE A10 INJECTION OSCILLATOR CARD		D 0.5						F 0.2				1 thru 9	
													3 thru 8	
													1 thru 9	

TABLE I. TOOL AND TEST EQUIPMENT REQUIREMENTS

TOOLS AND EQUIPMENT	MAINTENANCE CATEGORY	NOMENCLATURE	FEDERAL STOCK NUMBER	TOOL NUMBER
1	0	TOOL KIT, ELECTRONIC EQUIPMENT TK-101/G	5180-064-5178	
2	0	MUILIMETE TS-352B/U	6625-553-0142	
3	F	TOOL KIT, ELECTRONIC EQUIPMENT TK-105/G	5180-610-8177	
4	F	WATTMETER ME-82()/U (PART OF SET GROUP QA-1676, FSN 5820-543-1283)	6625-511-4392	
5	F	GENERATOR, SIGNAL AN/URM-127	6625-783-5965	
6	F	COUNTER, ELECTRONIC DIGITAL RFADOUT AN/USM-207A	6625-911-6368	
7	F	METER MODUIATION ME-57()	6625-647-3737	
8	F	MULTIMETER ME-30A	6625-643-1670	
9	D	SPECIAL DEPOT TEST EQUIPMENT		

By Order of the Secretary of the Army:

CREIGHTON W. ABRAMS
General, United States Army
Chief of Staff

Official:

VERNE L. BOWERS
Major General, United States Army
The Adjutant General

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Active Army:

USASA (2)	USAADS (2)
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ACSC-E (2)	USAARMS 12)
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COE (1)	USAES (2)
TSG (1)	AD (1) except
USAARENBD (1)	SAAD (30)
USAMB (10)	LBAD (14)
AMC 11)	TOAD (14)
MICOM (2)	ATAD (10)
TECOM (21)	USA Dep (21)
HISA (Ft Monmouth) (18)	Sig Sec USA Dep (2)
USACC 14}}	Sig Dep (2)
TRADOC (2)	ATS (1)
ARADCOM (21)	MAAG 11)
ARADCOM Rgn (2)	WRAMC (1)
OS Maj Cmd (4)	USARMIS 11)
LOGCOMD (3)	USAERDAA (1)
MDW (1)	USAERDAW (1)
Armies (2)	Sig FLDMS (11)
Corps (2)	Ft. Richardson (ECOM Ofc) (2)
Ft Gordon (10)	Units org under fol TOE:- 1 ea.
Ft Huachuca (10)	11-17
Ft Carson (5)	11-98
WSMR (1)	11-377
Svc Colleges (1)	11-5001AA-AC)
USASESS (5)	29-134
USAINTC (3)	29-136

ARNG & USAR: None.

For explanation of abbreviations used, see AR 310-60.

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL PUBLICATIONS

 <p style="font-size: small; margin: 0;"><i>THEN...JOT DOWN THE DOPE ABOUT IT ON THIS FORM. CAREFULLY TEAR IT OUT, FOLD IT AND DROP IT IN THE MAIL.</i></p>		SOMETHING WRONG WITH PUBLICATION	
		FROM: (PRINT YOUR UNIT'S COMPLETE ADDRESS)	
		DATE SENT	
PUBLICATION NUMBER		PUBLICATION DATE	PUBLICATION TITLE
IN THIS SPACE, TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT.			
BE EXACT PIN-POINT WHERE IT IS			
PAGE NO.	PARA-GRAPH	FIGURE NO.	TABLE NO.
PRINTED NAME, GRADE OR TITLE AND TELEPHONE NUMBER		SIGN HERE	

The Metric System and Equivalents

Linear Measure

1 centimeter = 10 millimeters = .39 inch
 1 decimeter = 10 centimeters = 3.94 inches
 1 meter = 10 decimeters = 39.37 inches
 1 dekameter = 10 meters = 32.8 feet
 1 hectometer = 10 dekameters = 328.08 feet
 1 kilometer = 10 hectometers = 3,280.8 feet

Weights

1 centigram = 10 milligrams = .15 grain
 1 decigram = 10 centigrams = 1.54 grains
 1 gram = 10 decigrams = .035 ounce
 1 decagram = 10 grams = .35 ounce
 1 hectogram = 10 decagrams = 3.52 ounces
 1 kilogram = 10 hectograms = 2.2 pounds
 1 quintal = 100 kilograms = 220.46 pounds
 1 metric ton = 10 quintals = 1.1 short tons

Liquid Measure

1 centiliter = 10 milliliters = .34 fl. ounce
 1 deciliter = 10 centiliters = 3.38 fl. ounces
 1 liter = 10 deciliters = 33.81 fl. ounces
 1 dekaliter = 10 liters = 2.64 gallons
 1 hectoliter = 10 dekaliters = 26.42 gallons
 1 kiloliter = 10 hectoliters = 264.18 gallons

Square Measure

1 sq. centimeter = 100 sq. millimeters = .155 sq. inch
 1 sq. decimeter = 100 sq. centimeters = 15.5 sq. inches
 1 sq. meter (centare) = 100 sq. decimeters = 10.76 sq. feet
 1 sq. dekameter (are) = 100 sq. meters = 1,076.4 sq. feet
 1 sq. hectometer (hectare) = 100 sq. dekameters = 2.47 acres
 1 sq. kilometer = 100 sq. hectometers = .386 sq. mile

Cubic Measure

1 cu. centimeter = 1000 cu. millimeters = .06 cu. inch
 1 cu. decimeter = 1000 cu. centimeters = 61.02 cu. inches
 1 cu. meter = 1000 cu. decimeters = 35.31 cu. feet

Approximate Conversion Factors

<i>To change</i>	<i>To</i>	<i>Multiply by</i>	<i>To change</i>	<i>To</i>	<i>Multiply by</i>
inches	centimeters	2.540	ounce-inches	Newton-meters	.007062
feet	meters	.305	centimeters	inches	.394
yards	meters	.914	meters	feet	3.280
miles	kilometers	1.609	meters	yards	1.094
square inches	square centimeters	6.451	kilometers	miles	.621
square feet	square meters	.093	square centimeters	square inches	.155
square yards	square meters	.836	square meters	square feet	10.764
square miles	square kilometers	2.590	square meters	square yards	1.196
acres	square hectometers	.405	square kilometers	square miles	.386
cubic feet	cubic meters	.028	square hectometers	acres	2.471
cubic yards	cubic meters	.765	cubic meters	cubic feet	35.315
fluid ounces	milliliters	29.573	cubic meters	cubic yards	1.308
pints	liters	.473	milliliters	fluid ounces	.034
quarts	liters	.946	liters	pints	2.113
gallons	liters	3.785	liters	quarts	1.057
ounces	grams	28.349	liters	gallons	.264
pounds	kilograms	.454	grams	ounces	.035
short tons	metric tons	.907	kilograms	pounds	2.205
pound-feet	Newton-meters	1.356	metric tons	short tons	1.102
pound-inches	Newton-meters	.11296			

Temperature (Exact)

°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C
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