TM 11-5820-552-15

DEPARTMENT OF THE ARMY TECHNICAL MANUAL

OPERATOR, ORGANIZATIONAL, DS, GS, AND DEPOT MAINTENANCE

MANUAL INCLUDING REPAIR PARTS AND SPECIAL TOOL LISTS

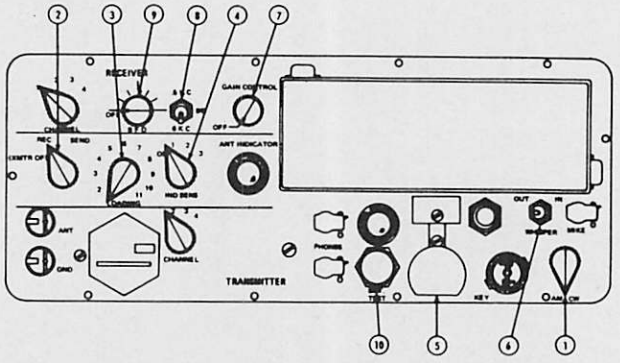
RADIO SET AN/PRC-64A

This copy is a reprint which includes current pages from Change 1.

HEADQUARTERS, DEPARTMENT OF THE ARMY

NOVEMBER 1970

CONDENSED OPERATING INSTRUCTIONS
FOR RADIO SET AN/PRC-64A



THE NUMBERS OF STEPS 1 THROUGH 8 ARE THE SAME AS THE NUMBERS ON THE ILLUSTRATION

INSTALL BATTERY, MICROPHONE (FOR VOICE TRANSMISSIONS), HEADSET AND ANTENNA. SET BOTH CHANNEL SELECTORS TO DESIRED CHANNEL.

TO TRANSMIT

1. SET AM CW SWITCH TO CW
2. SET REC SEND SWITCH TO SEND
3. SET LOADING CONTROL to 1
4. SET IND SENS TO 1
5. HOLD INTERNAL KEY DOWN AND ADJUST LOADING CONTROL FOR MAXIMUM BRIGHTNESS OF ANT INDICATOR LAMP. ADVANCE IND SENS TO 2 OR 3 IF NECESSARY TO SECURE VISIBLE LAMP INDICATION. WHEN BEST LOADING IS ACHIEVED TURN IND SENS TO OFF.

KEY MESSAGE. FOR VOICE TRANSMISSION USE MICROPHONE AND SET AM CW SWITCH TO AM.

6. IF NECESSARY TO KEEP VOICE DOWN IN AM MODE SET WHISPER SWITCH TO IN.

TO RECEIVE

2. SET REC SEND SWITCH TO REC
7. SET GAIN CONTROL TO DESIRED VOLUME

FOR CW RECEPTION:

8. SET B.W. SWITCH TO .5 kHz
9. SET BFO CONTROL TO DESIRED CODE TONE

FOR AM RECEPTION

8. SET B.W. SWITCH TO 6 kHz
9. SET BFO CONTROL TO OFF

TO TURN OFF RADIO SET

2. SET REC SEND SWITCH TO REC
7. SET GAIN CONTROL TO OFF

TO TEST BATTERY

10. PRESS BAT. TEST SWITCH. IF INDICATOR LIGHTS BATTERY IS OK

TM 5820-552-15-1

WARNING

Never erect the AN/PRC–64A antenna near or over high tension wires. Contact of the antenna wire with a high tension wire can cause death or severe injury.

WARNING

Operator and maintenance personnel should be familiar with the requirements of TB SIG 291 before attempting installation or operation of the equipment covered in this manual. Failure to follow requirements of TB SIG 291 could result in injury or DEATH.

TECHNICAL MANUAL
No. 11-5820-552-15

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, DC, *16 November 1970*

OPERATOR'S, ORGANIZATIONAL, DIRECT SUPPORT, GENERAL SUPPORT, AND DEPOT MAINTENANCE MANUAL
RADIO SET AN/PRC-64A
(NSN 5820-00-143-4095)

LIST OF ILLUSTRATIONS

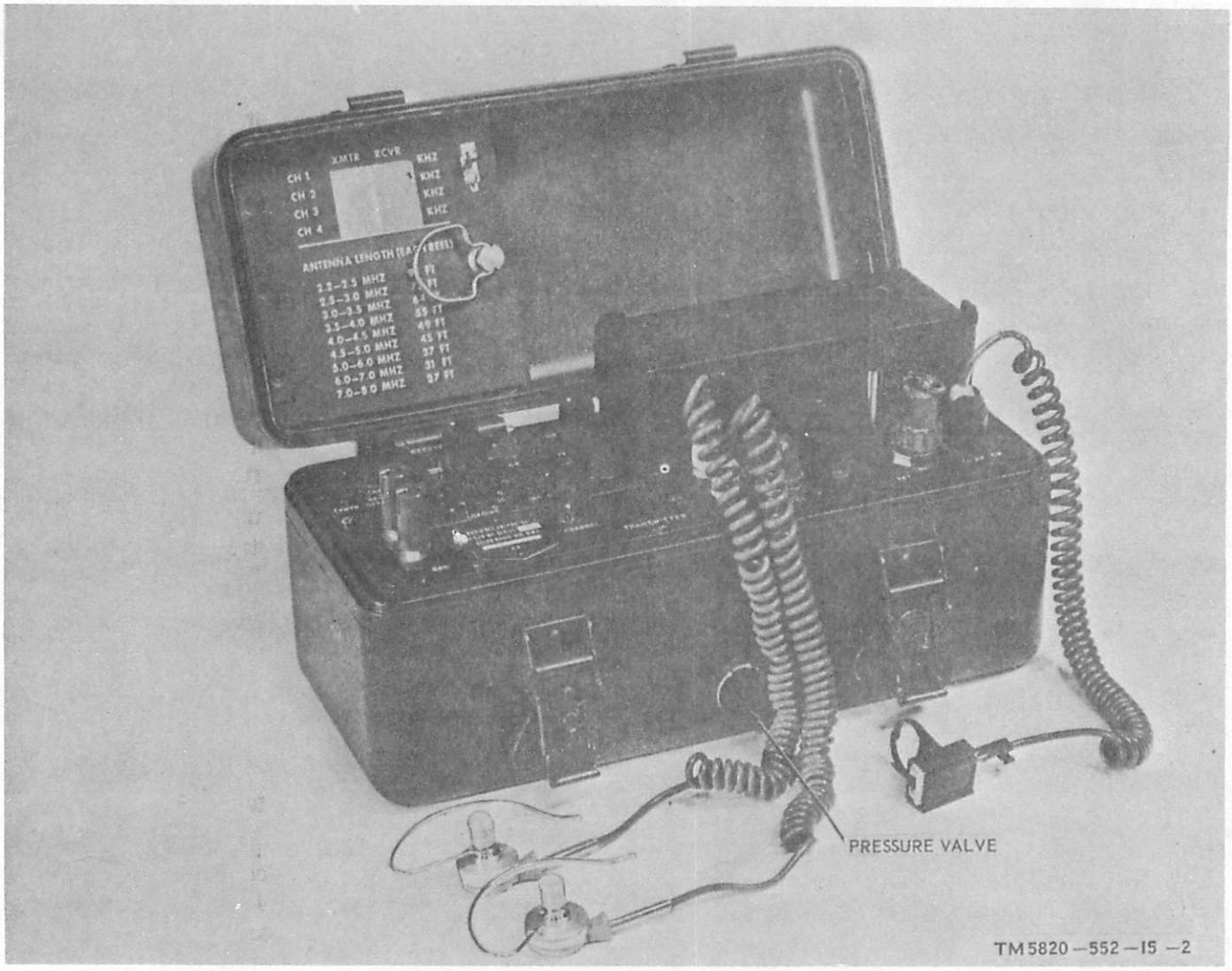


Figure 1–1. Radio Set AN/PRC–64A.

CHAPTER 1
INTRODUCTION

Section I. GENERAL

1-1. Scope

This manual describes Radio Set AN/PRC-64A. The manual covers installation, operation, and maintenance. It includes instructions for cleaning, checking, and inspecting the equipment and replacing the battery. The organizational maintenance chapter includes information on troubleshooting and repair procedures within the capabilities of the organizational repair technician.

1-2. Indexes of Publications

a. DA Pam 310-4. Refer to DA Pam 310-4 to determine whether there are new editions, changes, or additional publications pertaining to the equipment.

b. DA Pam 310-7. Refer to DA Pam 310-7 to determine whether there are modification work orders (MWO's) pertaining to the equipment.

1-3. Forms and Records

a. Reports of Maintenance and Unsatisfactory Equipment. Maintenance forms, records, and reports which are to be used by maintenance personnel at all maintenance levels are listed in and prescribed by TM 38-750.

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

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

1-3.1. Reporting of Errors

The reporting of errors, omissions, and recommendations for improving this publication by the individual user is encouraged. Reports should be submitted on DA Form 2028 (Recommended Changes to Publications and Blank Forms) or DA Form 2028-2 and forwarded direct to Commander, US Army Communications and Electronics Materiel Readiness Command, ATTN: DRSEL-MA-Q, Fort Monmouth, NJ 07703.

1-3.2. Reporting Equipment Improvement Recommendations (EIR)

EIR's will be prepared using DA Form 2407, Maintenance Request. Instructions for preparing EIR's are provided in TM 38-750, the Army Maintenance Management System. EIR's should be mailed direct to Commander, US Army Communications and Electronics Materiel Readiness Command, ATTN: DRSEL-MA-Q, Fort Monmouth, NJ 07703. A reply will be furnished direct to you.

1-3.3. Administrative Storage

Prior to or after an administrative storage period, the preventive maintenance procedures contained in paragraphs 4-4 and 5-4 should be performed. Crystals and the battery are removed and stored separately during administrative storage.

1-3.4. Destruction of Army Electronics Materiel

Destruction of Army electronics materiel to prevent enemy use shall be in accordance with TM 750-244-2. Refer to paragraphs 9-3 through 9-5 for additional information.

Section II. DESCRIPTION AND DATA

1-4. Purpose and Use

(fig. 1-1)

Radio Set AN/PRC-64A is a battery operated, crystal controlled, radio transceiver which operates in the frequency range of 2.2 to 6.0 megahertz (MHz). It receives amplitude modulated (am), single sideband (ssb) voice transmissions and continuous wave (cw) radio telegraph code transmissions. It also transmits am voice or cw code. Operating frequency is determined by crystals installed in both transmitter and receiver and transmitter channel selection switches. The AN/PRC-64A is housed in a waterproof case which contains the radio set, headphones, microphone, alignment tools and spare parts. The case is carried in a carrying bag which also contains reels of antenna wire, counterpoise wire, and transmission line.

1-5. Technical Characteristics

Frequency range	2.2 to 6 MHz
Tuning, receiver section.	4 crystal controlled channels, switch selected.

Tuning, transmitter section.	4 crystal controlled channels, switch selected.
Crystal type required (pluck out):	
Receiver section	CR-78/U (channel frequency plus 455 kHz).
Transmitter section.	CR-89/U (channel frequency)
Channel frequency range (Receiver and Transmitter).	Channel 1 2.2 to 2.85 MHz; Channel 2 2.8 to 3.65 MHz; Channel 3 3.6 to 4.70 MHz; Channel 4 4.6 to 6.00 MHz.
Transmitter section:	
Power output	5 watts cw or 1.5 watt voice, minimum.
Modulation	Am, up to 90%
Microphone	1900 ohms, magnetic
Voice sidetone	In headphones
Key for cw	Built in on panel. External key jack provided.
Keying sidetone	Audio tone in headphone
Keying Speeds:	
With built in key	Up to 12 wpm
With external key	Up to 300 wpm
Antenna impedance	50 ohms
Receiver section:	
Sensitivity	5 microvolts am, 30% modulation or 2 microvolts cw for 1 milliwatt of audio output.
Maximum power output.	5 milliwatts
Bandwidth	am 6 kHz @ 6 db down points 12 kHz @ 60 db down points; cw 500 Hz @ 6 db down points; 1000 Hz @ 60 db down points.
Input impedance	50 ohms (approximately)
Output and headset impedance.	600 ohms
Electrical:	
Battery type	BA-1509/PRC-64
Battery voltages, open circuit.	+32.4 v, +13.5 v and +4.05 v
Nominal (under load).	+28 v, +12 v and +4 v
Battery drain (typical):	
Receiver	13 ma @ 4 v, no signal
Transmitter	700 ma @ 28 v, for cw 300 ma @ 28 v for voice
Battery connector in AN/PRC-64A.	4 conductor, Cinch-Jones No. 13279
Antenna:	
Antenna, on reel	96 feet, single conductor with frequency markers.
Counterpoise, on reel.	96 feet, single conductor with frequency markers.
Transmission line, on reel.	35 feet, 75-ohm twin line with molded "y" connector.

1-6. Components and Dimensions

a. Components. The components of Radio Set AN/PRC-64A are listed below.

Component	*Quantity*	*FSN*
Radio Set AN/PRC-64A	1	5820-143-4095
Carrying bag	1	5820-438-1919
Antenna	1	
Counterpoise	1	
Transmission line	1	5995-477-3871
Headset	2	
Microphone		
Reel	3	5820-463-4693

b. Dimensions. The dimensions and weight of the components are listed below.

Component	Height (in.)	Depth (in.)	Width (in.)	Unit weight (lb)	Fig. No.
Radio Set AN/PRC-64A	5	4½	10	7¼*	1-2
Carrying bag	5½	5½	13¾	1	
Antenna reel	5 inch diameter		½	.75	1-2
Counterpoise reel	5 inch diameter		½	.75	1-2
Transmission line reel	5 inch diameter		½	.56	1-2

*With battery installed.

1-7. Description of Radio Set AN/PRC-64A (fig. 1-2)

a. General. The AN/PRC-64A is a self-contained, four-channel portable transceiver operating in the high frequency (hf) portion of the radio spectrum in the range of 2.2 to 6.0 MHz.

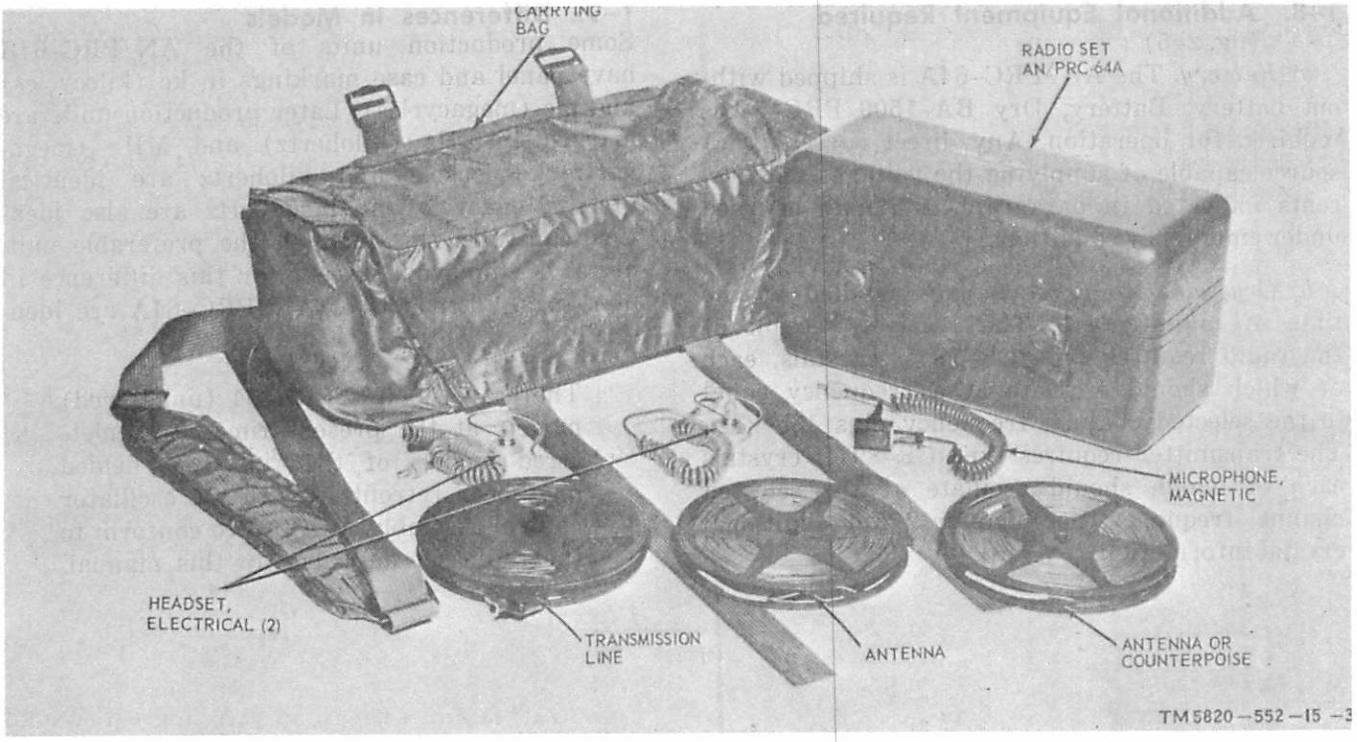


Figure 1-2. Radio Set AN/PRC-64A, components.

The radio set is contained in an all metal, waterproof case which, when closed, is capable of withstanding immersion in 3 feet of water. Two turnbuckle fasteners keep the case tightly closed. The hinged lid of the case contains a compartment in which are stored the microphone, headsets, and spare indicator lamps. The lid of the storage compartment contains a clip in which is kept a socket head key for tightening control knobs.

b. Electronic Assembly. The electronic assembly is mounted on a single top plate assembly which contains all controls, grouped by function. Access to the battery is gained by unsnapping a single battery cover. Access to internal adjustments and crystals is gained by removing the top plate assembly from the case.

c. Tools. Alignment tools and alignment instructions for use by general support maintenance personnel are stored inside the case and made accessible by removing the top plate assembly.

d. Carrying Bag. A cloth, olive-drab carrying bag is provided for carrying the AN/PRC-64A and its antenna components. Straps on the carrying bag provide for hand or shoulder carrying.

e. Antenna Components. Three reels of antenna components are provided. The antenna consists of 96 feet of single conductor, stranded, insulated wire wound on a 5-inch diameter reel. Frequency markers on the antenna wire indicate the proper length antenna for each frequency group. A counterpoise, which serves as a ground is reeled and marked in identical manner. A third reel contains 35 feet of 75-ohm twin lead connected to a "y" fitting and serves as a connection from radio to antenna when a half-wave antenna configuration is employed.

f. Minor Components.

(1) *Headsets.* Two headsets are provided for radio reception. Each headset is equipped with a coiled cord, earphone, earpiece and earphone holder.

(2) *Microphone.* A magnetic microphone is provided for voice transmission. The microphone is equipped with a coiled cord and a holder to allow the microphone to be worn as a finger ring.

(3) *Tools.* Three tools are provided for maintenance purposes. A socket head key (Allen wrench) is provided for tightening control knobs. Two alignment tools, stored inside the case, are provided for alignment when installing or changing crystals. An alignment instruction card is also provided inside the case.

1–8. Additional Equipment Required (fig. 2–5)

a. Battery. The AN/PRC–64A is shipped without battery. Battery, Dry BA–1509/PRC–64 is required for operation. Any direct current (dc) source capable of supplying the voltages and currents indicated in paragraph 1–5 may be used under emergency conditions.

b. Crystals. No crystals are installed at the time of manufacture. The receiver section of the radio requires type CR–78/U crystals, each of which should oscillate at a frequency equal to the selected channel frequency plus 455 kHz. The transmitter requires type CR–89/U crystals each of which should oscillate at the selected channel frequency. See chapter 2, for additional crystal information.

1–9. Differences in Models

Some production units of the AN/PRC–64A have panel and case markings in kc (kilocycles) and mc (megacycles). Later production units are marked in kHz (kilohertz) and MHz (megahertz). Kilocycle and kilohertz are identical units. Megacycle and megahertz are also identical units. In this manual, the preferable unit, hertz, is employed. Except for this difference in markings, all models of AN/PRC–64A are identical.

NOTE

There are no AN/PRC–64 (unlettered) models at the present time. All unlettered models of the radio set fielded have been retrofitted with the oscillator control assembly A4A9A3 to conform to the radio set described in this manual.

CHAPTER 2

INSTALLATION

Section I. SERVICE UPON RECEIPT OF EQUIPMENT

2–1. Unpacking the Radio Set AN/PRC–64A

(fig. 2–1)

a. Packaging Data. When packed for shipment the components of one AN/PRC–64A are placed in a moisture-resistant unit carton. Twelve unit cartons are placed in a wooden packing box.

b. Packaging Dimensions.

Package	Overall dimensions (in.)			Volume (cu ft)	Weight (lb)	Contents
	Height	Width	Depth			
Wooden crate	16¼	27¾	16¼	12.55	130	12 Unit Cartons
Unit carton	7	6⅝	12⅝	0.4	9½	Radio set technical manuals in bag.

c. Removing Contents.

NOTE

When unpacking equipment that is packed only in cartons omit the procedure given in (1) and (2) below.

(1) Cut and fold back the metal straps.

(2) Remove the nails from the top and one side of the wooden packing box with a nail-puller. Do not pry off the boards. Prying may damage the equipment.

(3) Remove the unit cartons and open those needed.

(4) Remove and open the envelope that contains the technical manual.

(5) Remove the radio set.

2–2. Checking Unpacked Equipment

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

b. Check to see that the equipment is complete as specified in paragraph 1–6*a*. Report all discrepancies in accordance with TM 38–750. 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. If the equipment has been modified, the MWO number will appear on the front panel, near the nomenclature plate. Check also to see whether all MWO's current at the time the equipment is placed in use have been applied.

Section II. INSTALLATION INSTRUCTIONS

2–3. Installation of Equipment

Before the AN/PRC–64A can be used, it will usually be necessary to install a battery and oscillator crystals for both transmitter and receiver. Battery installation is an organizational function. However, the installation of crystal must be made by general support, or higher level maintenance personnel.

2–4. Tools Required

No tools are required for installation of the battery. A small blade screwdriver is the only tool needed for installation of crystals. This screwdriver can be found in Tool Kit, Electronic Equipment, TK–101G, FSN 5180–644–5178. Alignment tools are contained in the AN/PRC–64A case. A 50-ohm, 10-watt resistor is required for alignment.

2–5. Installation of Transmitter Crystals

(figs. 2–2 and 2–3)

NOTE

The following procedure must be per-

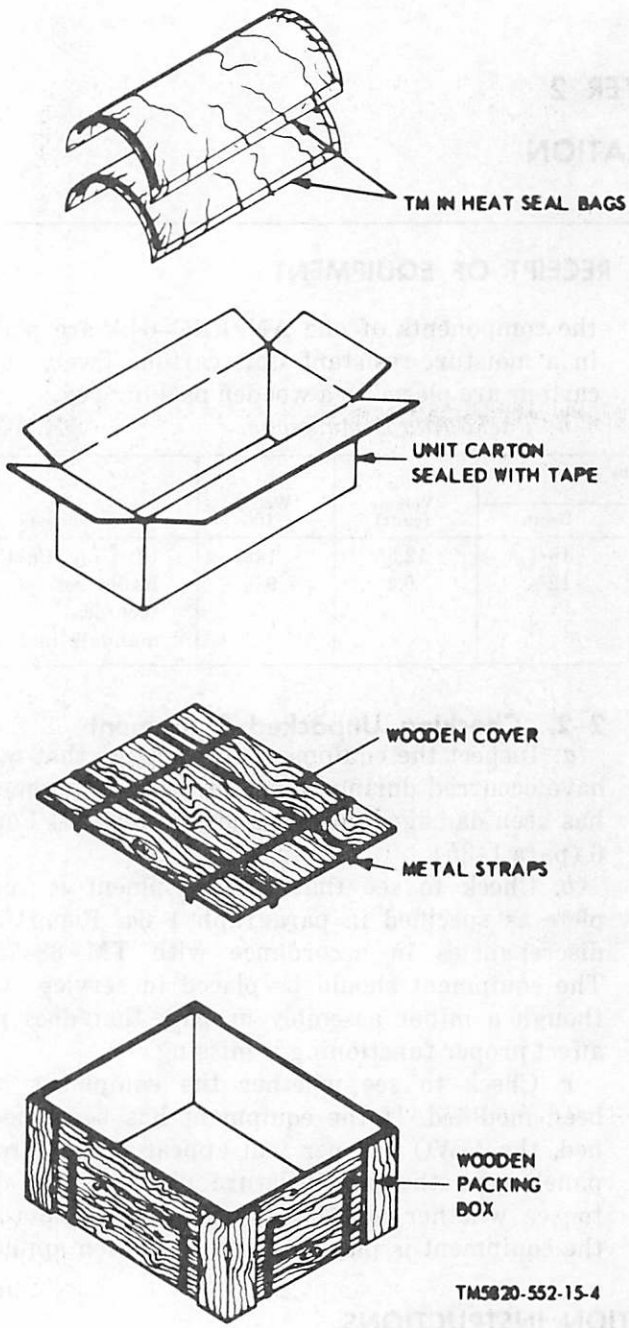


Figure 2–1. Typical packaging.

formed by general support or higher level maintenance personnel.

a. Open the AN/PRC–64A case cover by unscrewing the pressure valve, and then unlocking the two turnbuckle fasteners.

b. Remove ten screws which hold the top plate assembly to the case (fig. 2–2) and lift out the entire top plate assembly. Place the assembly on a bench or tabletop (fig. 2–3).

c. Install up to four type CR–89/U crystals in the transmitter crystal sockets (fig. 2–3). Each channel covers only a specific frequency range as follows:

Channel 1	2.2 to 2.85 MHz
Channel 2	2.8 to 3.65 MHz
Channel 3	3.6 to 4.70 MHz
Channel 4	4.6 to 6.00 MHz

For each channel use only crystals having frequencies with the range shown. Note in figure 2–3 that the crystal sockets are marked with channel numbers.

d. Unsnap two fasteners holding battery cover and remove cover.

e. Install a battery in battery compartment (para 2–7).

NOTE

Insure that the battery interlock switch is in the raised position to connect battery to circuit.

f. Referring to figure 3–1, connect a 50-ohm, 10-watt resistor from the ANT to the GND terminals of the radio set.

g. Set the REC–SEND switch to SEND, the LOADING control on "1," the AM–CW switch on CW, the IND SENS switch to "3," and the transmitter CHANNEL switch on "1."

h. Refer to figure 2–3. Using the alignment tool located in the radio set case, adjust driver coil "1" and final amplifier coil "1" for maximum brightness of the ANT INDICATOR lamp while holding down the internal CW key. Turn the IND SENS switch to the lowest number giving an indication and again adjust the two coils until a maximum brightness is obtained at the lower sensitivity level.

i. Set the transmitter CHANNEL switch on "2" and, while depressing the key, adjust driver coil "2" and final amplifier coil "2" for maximum brightness of the ANT INDICATOR lamp using the same procedure as indicated in *g* above.

j. Repeat the procedure for channels 3 and 4, using the appropriate positions of the CHANNEL switch and adjusting the coils indicated in figure 2–3. Use the same procedure as indicated in *h* above.

k. Turn IND SENS switch to OFF.

2–6. Installation of Receiver Crystals (fig. 2–4)

a. Turn the top plate assembly for access to the receiver crystal socket.

b. Install up to four type CR–78/U crystals in

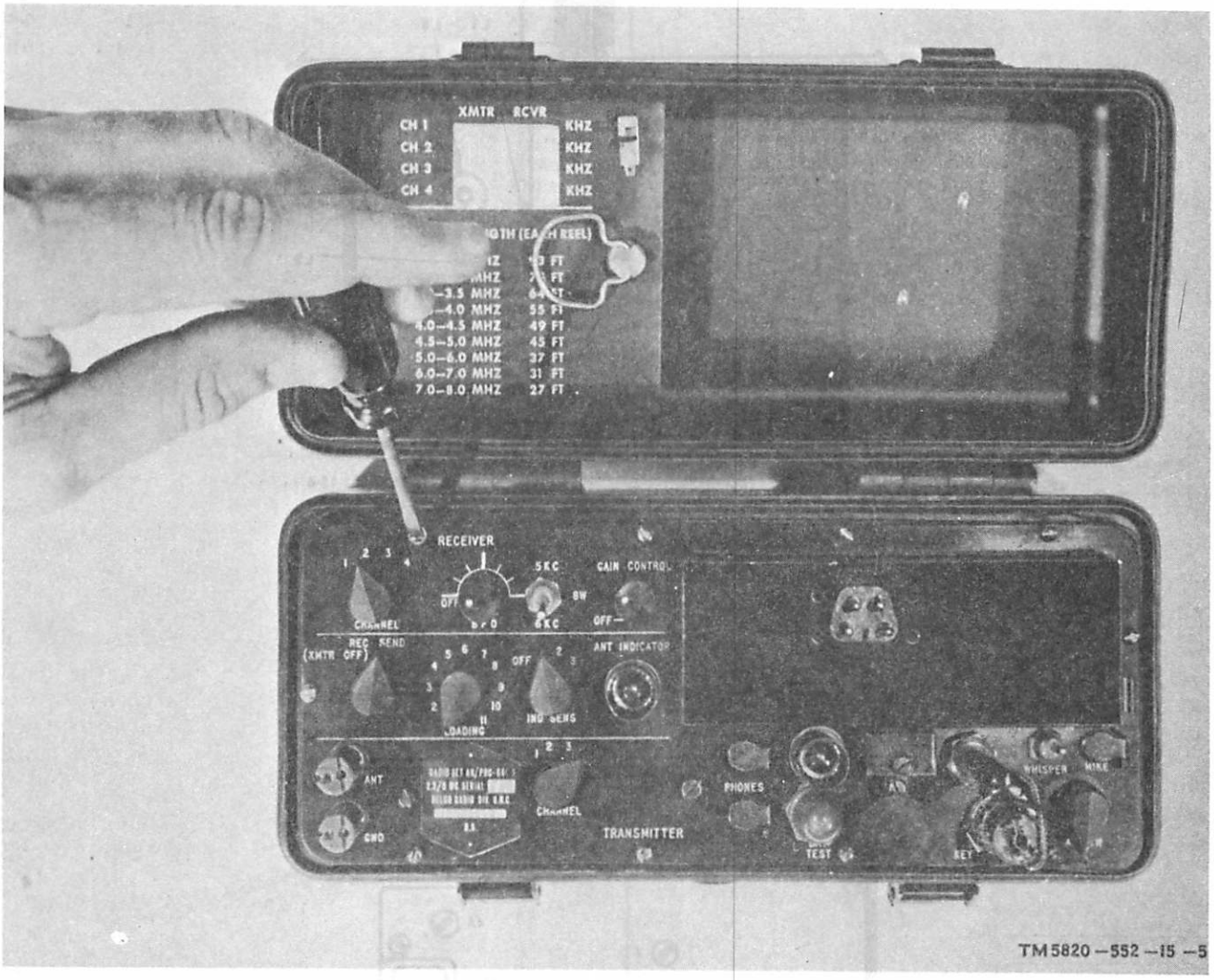


Figure 2–2. Radio Set AN/PRC–64A, top plate assembly removed.

the receiver crystal sockets (fig. 2–4). Each receiver channel is designed to operate over the same restricted range of frequencies as the transmitter channels (para 2–5*c*). Note that each receiver crystal frequency should be 455 kHz higher than the radio frequency to be received. Note in figure 2–4 that the crystal sockets are marked with channel numbers.

c. Referring to figure 3–1, set the REC–SEND switch to REC, the BFO to OFF, the BW (bandwidth) to .5 KC–6KC switch to 6KC and the GAIN CONTROL to its maximum clockwise position. Connect a headphone to one of the PHONES jacks.

d. Refer to figure 2–4. Set the receiver CHANNEL switch to "1". Using the alignment tool from the AN/PRC–64A case, adjust RF collector coil "1" and RF antenna coil "1A" for maximum noise in the headset.

e. Repeat the procedures for channels 2, 3 and 4, setting the CHANNEL selector switch, and adjusting the corresponding numbered RF coils for each channel.

f. Turn the GAIN CONTROL to OFF, remove the headset plug from the PHONES jack and remove the 50-ohm resistor from the ANT and GND connectors. Replace alignment tools in their retaining clips.

g. Replace the top plate assembly and replace

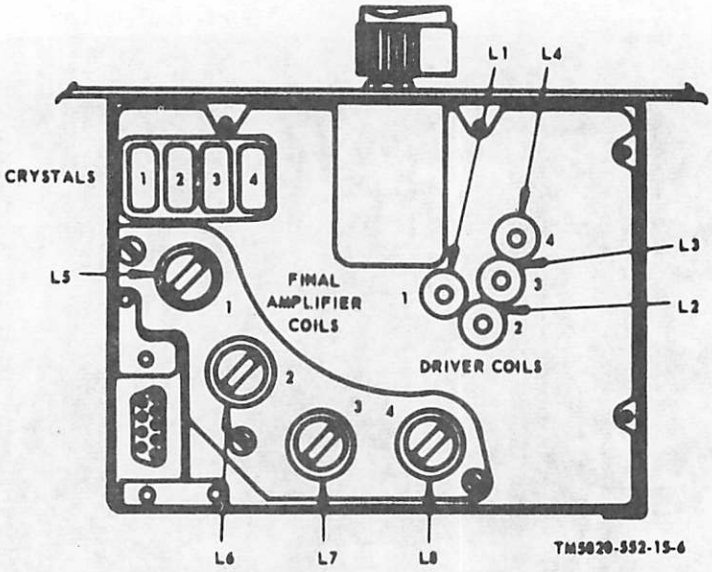


Figure 2–3. Transmitter crystals, installation and alignment.

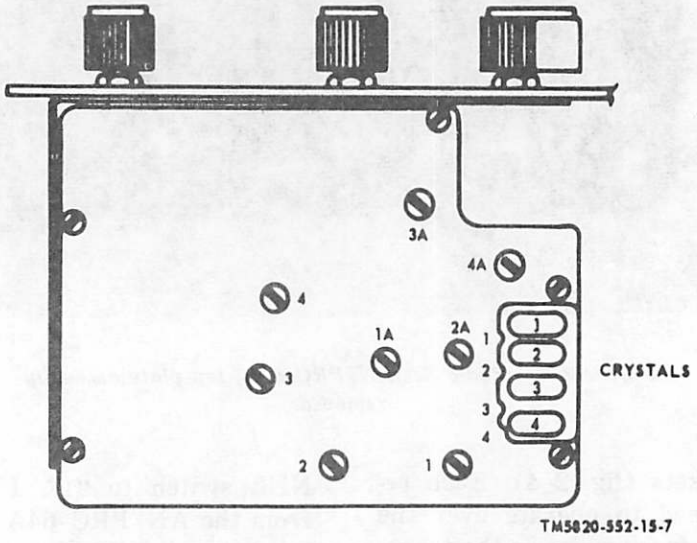


Figure 2–4. Receiver crystals, installation and alignment.

the ten retaining screws, tightening each firmly with a screwdriver blade.

h. Replace the headset in its compartment on the case lid and close the compartment cover.

i. Close the cover, tighten the two turnbuckle fasteners and tighten the pressure valve by turning it clockwise until finger tight.

2–7. Installation and Testing of Battery (fig. 2–5)

The installation of the battery may be accomplished by the organizational repair man, as follows:

a. Open the radio set case (para 2–5*a*).

b. Remove the battery cover by unsnapping two positive lock fasteners, one at the back of the cover and the other at the right side of the cover. Lift off the cover.

c. Insert battery BA–1509/PRC–64 (para 1–8*a*.), with a slight rocking motion so that the battery socket mates with the connector pins in the battery compartment.

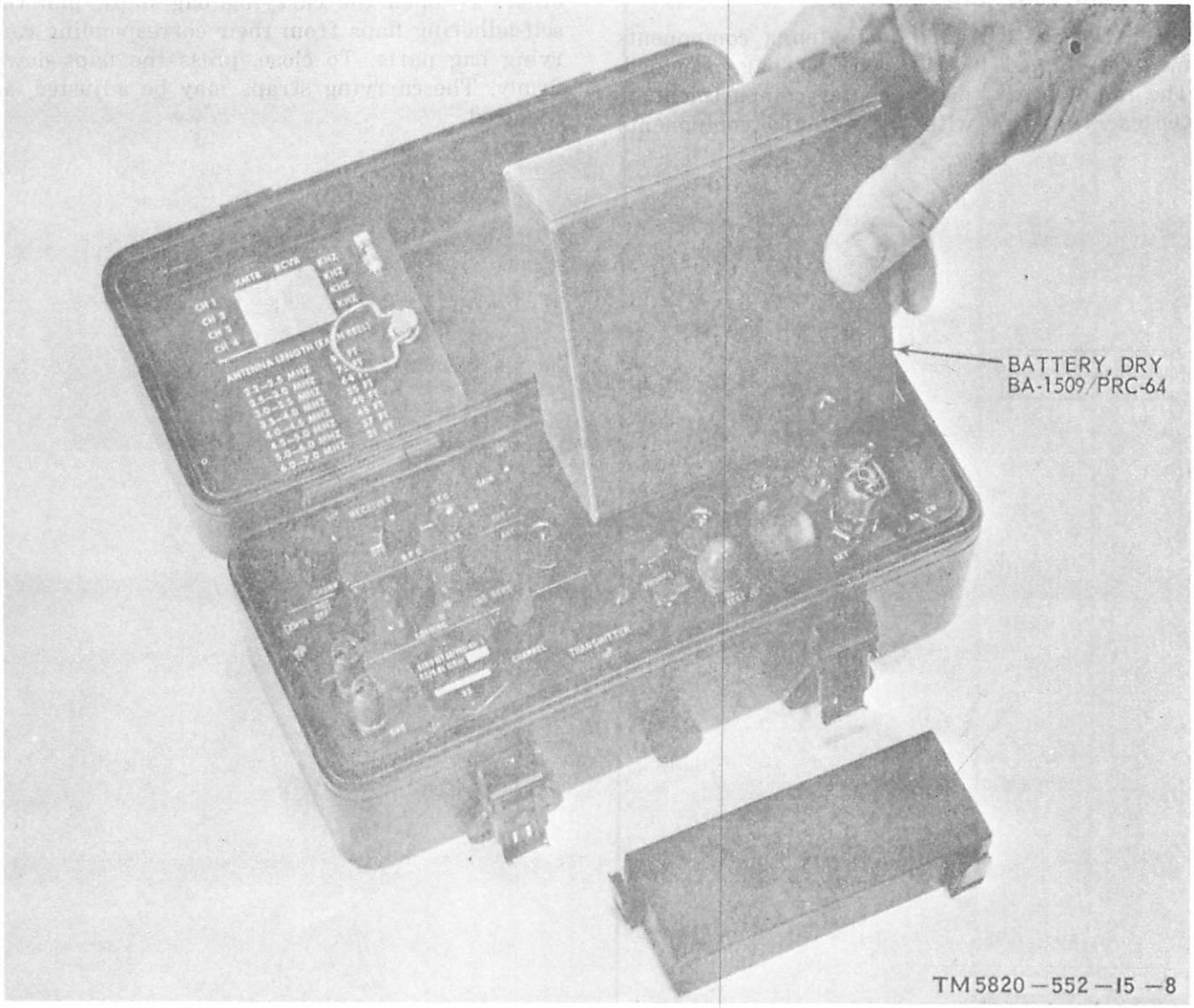


Figure 2–5. Battery installation.

d. Press the battery firmly in place and replace the battery cover. Snap the two positive lock fasteners.

2–8. Testing the Battery
(fig. 3–1)

After installation of a new battery and at regular intervals thereafter the battery may be tested as follows:

a. Place the REC–SEND switch in the SEND position. Be sure the telegraph KEY is in its up position.

NOTE

Insure that battery-interlock switch is in the fully raised position to effect connection between battery and circuit.

b. Press the BAT. TEST switch and observe the indicator lamp immediately to the rear of the switch. If the lamp illuminates, the battery 28-volt supply is above 20 volts and is satisfactory for operation.

c. No test is provided for the 4-volt or 12-volt supply; however, if the 28-volt test is satisfactory, the 4-volt and 12-volt supplies will also be adequate.

2-9. Installation of Equipment in Carrying Bag

The AN/PRC-64A and its antenna components may be carried in the carrying bag provided. The radio set fits in the center compartment of the carrying bag with the antenna components in one side pocket and a spare battery in the other. To open the carrying bag flaps, pull the self-adhering flaps from their corresponding carrying bag parts. To close, press the flaps down firmly. The carrying straps may be adjusted, as required.

CHAPTER 3
OPERATION

CAUTION

Do not leave the radio set SEND–REC switch in the SEND position for long periods of time especially with the antenna disconnected. Such action can cause serious damage to the radio set.

Section I. OPERATOR'S CONTROLS AND INDICATORS

3–1. Controls, Indicators, and Connectors
(fig. 3–1)

The following chart lists the controls, indicators, connectors, and jacks located on the top plate assembly of the radio set, and indicates their respective functions also.

Control, indicator, or connector	*Function*
Receiver Section (top):	
CHANNEL selector switch.	Selects one of four receiver crystals in the 2.2 to 6.0 MHz band.
BFO (beat frequency oscillator control.	Adjusts the tone frequency for code (cw) or single-sideband (ssb reception).
BW (bandwidth) .5kc–6kc switch.	Adjusts the bandwidth of the intermediate frequency (IF) circuit of the receiver by connecting an appropriate filter in the receiver circuit. Normally the .5 kc position is used for cw reception and the 6 kc position is used for am reception.
GAIN CONTROL	Adjusts receiver RF gain and turns receiver off.
Matching network center section:	
REC–SEND switch.	Turns on either receiver or transmitter.
LOADING control	Adjusts inductance of the antenna loading coil to match the radio set to the antenna being used.
IND SENS switch	Adjusts the sensitivity and therefore the brilliance of the ANT INDICATOR lamp. Maximum sensitivity is position 3.
Transmitter and lower control panel:	
ANT connector	Provides connection for antenna.
GND connector	Provides connection for external ground or counterpoise.
CHANNEL selector switch.	Selects one of four transmitting channels in the 2.2 to 6.0 MHz band.
PHONES jacks	Provides connection for external headsets.
BAT. TEST switch and indicator.	Tests battery by lamp brightness indication.
Internal telegraph key.	Used for transmitting cw code transmissions.
Battery interlock switch.	Disconnects battery from circuit when case lid is closed (switch in lowered position) and connects battery to circuit when case lid is opened (switch in raised position).

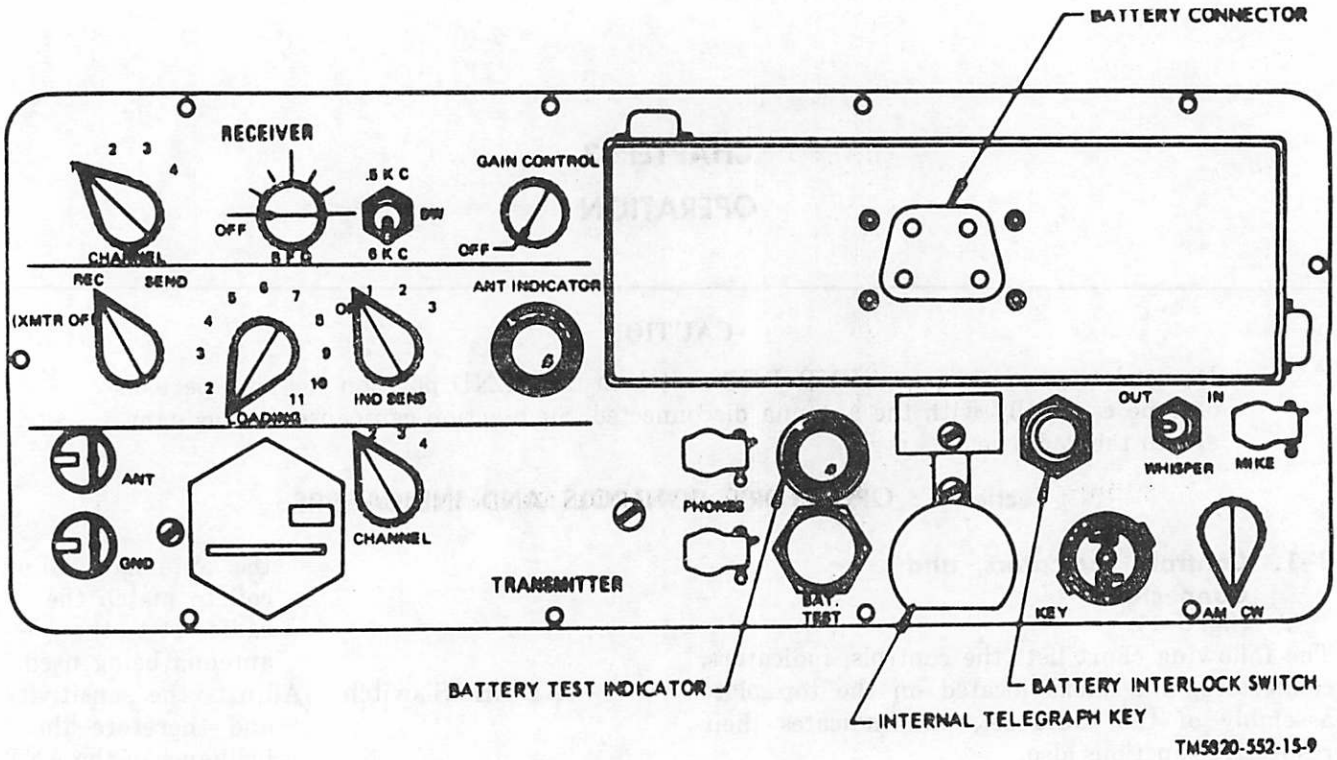


Figure 3-1. Radio Set AN/PRC-64A, controls, indicators and connections.

KEY plug and jack. Provides connection for external telegraph key or high-speed keyer. Plug is kept in jack when external key is not employed.

WHISPER IN-OUT switch. Changes microphone sensitivity. Maximum sensitivity and modulation are achieved when switch is set to the IN position.

MIKE jack ..... Provides connection for external microphone for am transmissions.

AM-CW switch ... Selector switch for selecting cw or am mode of transmission.

Battery connector . Mates with connector in battery BA-1509/PRC-64. Functionally the battery is not a part of the top plate assembly.

Section II. OPERATION UNDER USUAL CONDITIONS

WARNING

Never erect the antenna near or over high tension wires. Contact of the antenna wire with a high tension wire can cause DEATH or serious injury.

3-2. Erection of Antenna Components (fig. 3-2)

The antenna components supplied with the AN/PRC-64A provide for the rapid erection of three basic types of antennas. These antennas and conditions indicated for their use are as follows:

a. Quarter-Wave Antenna (fig. 3-2*a*). This is the simplest antenna and the fastest to erect. It consists of an antenna of specified length and a ground connection or counterpoise.

b. Direct Connected Half-Wave Antenna (fig. 3-2*b*). This antenna is similar to the one in *a*

above except that antenna and counterpoise sections are of equal length. It is slightly more efficient but requires a longer time for erection, since both antenna and counterpoise must be measured.

c. Half-Wave With Transmission Line (fig. 3-2*c*). This is the most efficient of the three antennas, providing maximum directivity. It requires supports for both sections of the antenna, and works best when elevated as high as possible. Instead of direct connection to the radio set, antenna and counterpoise are connected to a molded block on the transmission line. The opposite end of the line is then connected to the AN/PRC-64A ANT and GND connectors.

3-3. Antenna Length

To be efficient, the antenna length must be matched as closely as possible to the frequency of operation. Both the antenna and counterpoise conductors have sleeving at specified lengths, marked with the frequency of operation. For most efficient operation the quarter-wave antenna, and each section of the half-wave antenna should be carefully measured as follows:

Frequency of operation, MHz	*Antenna section length, ft.*
2.2 to 2.5	93
2.5 to 3.0	75
3.0 to 3.5	64
3.5 to 4.0	55
4.0 to 4.5	49
4.5 to 5.0	45
5.0 to 6.0	37

NOTE

This chart is also printed in the cover of the radio set case.

3-4. Siting of Antennas

Select a site relatively free of obstructions especially in the direction of transmission. Trees or poles may be used for antenna supports. Transmission and reception are best over water or level ground.

a. Unroll one reel of antenna wire to the length indicated by the chart (para 3-3). The specified lengths are marked by short pieces of sleeving over the wire.

b. Tie the reel to prevent further unrolling. DO NOT CUT THE WIRE.

c. Suspend the tied reel over a tree limb or other support as high as practical and in a direction, as nearly perpendicular as possible to the direction of transmission (fig. 3-2).

d. If a half-wave antenna is to be used, repeat steps *a*, *b*, and *c* above with the other reel of antenna wire, but in the opposite direction.

e. If a quarter-wave antenna is to be used, connect a short length of wire from the GND connector of the AN/PRC-64A to a pipe, wire fence, or steel building frame. If no such ground is available, unroll the second reel of wire to its full length and lay the wire directly on the ground in a direction opposite to the antenna wire.

f. For quarter-wave (fig. 3-2) and direct connected half-wave (fig. 3-2), connect the free end of the antenna to the ANT connector on the AN/PRC-64A. Then connect the ground wire or counterpoise to the GND connector. To place wires in the ANT and GND connectors, press the top of the connector down and insert the wire in the slot in the left side of the connector, then release the top of the connector.

g. If the half-wave antenna with feed line is to be used (fig. 3-2) the free ends of the two antenna wires are connected to the terminals in the molded block on the end of the transmission line, and the entire assembly elevated as shown in figure 3-2. Then connect the free end of the transmission line to the ANT and GND connectors of the AN/PRC-64A. Either conductor may be connected to either connector. When this configuration is used, the antenna lengths should be as close as possible to those specified in paragraph 3-3.

3-5. General Starting Procedure (fig. 3-1)

After a complete shutdown, or when starting the Radio Set AN/PRC-64A for the first time, perform the general starting procedures given in *a* through *g* below before attempting operation. If the equipment is already in an operable condition or when merely changing operating frequencies, it is not necessary to perform the complete starting procedures but only the antenna loading steps *e* through *g* below.

NOTE

Prior to any cw (para 3-6), am (para 3-7), or ssb (para 3-8) operation, the following general starting procedures must be performed for the purpose of achieving proper antenna loading.

a. Erect the antenna (para 3-4) and connect to the radio set.

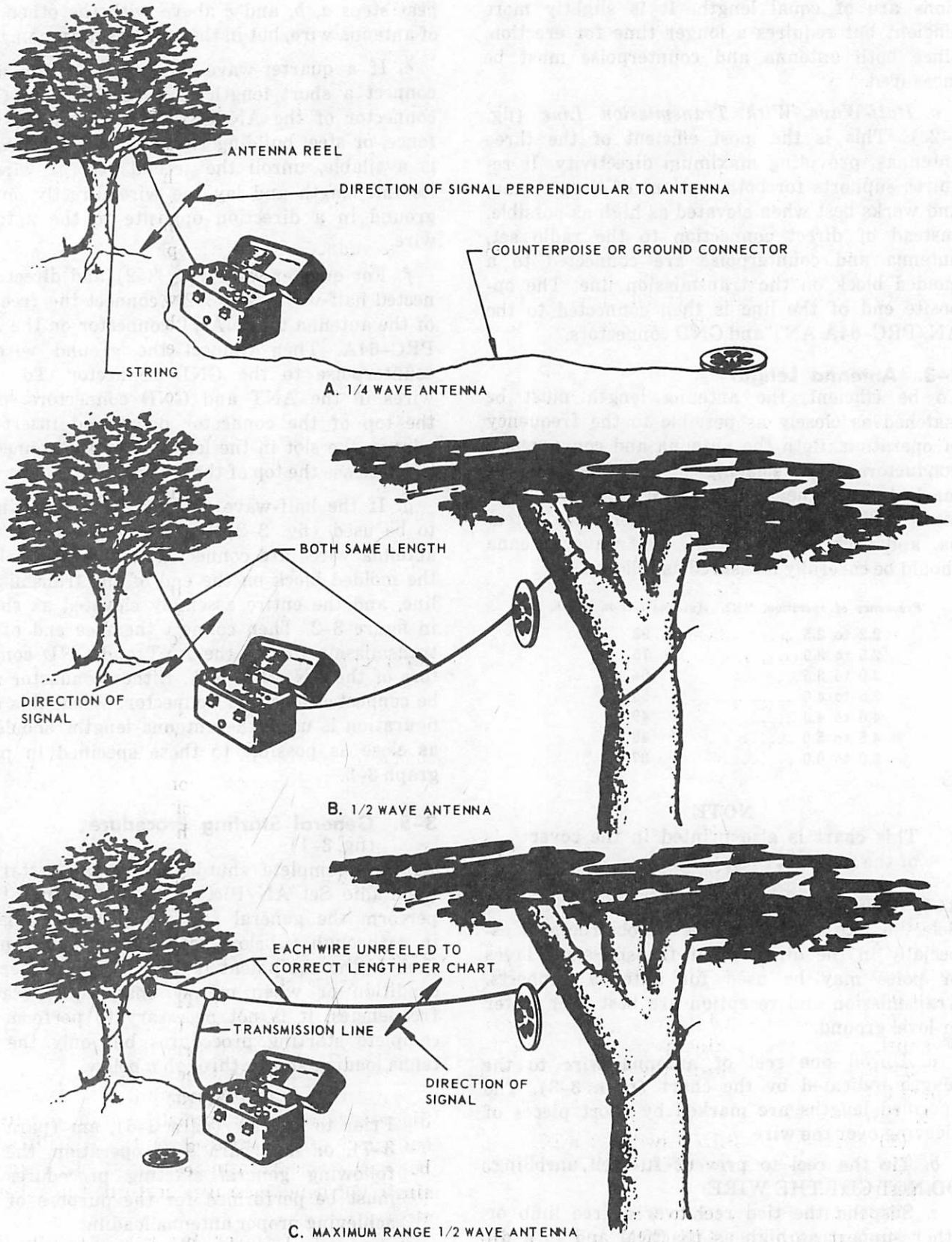


Figure 3-2. Typical antenna erection methods.

b. Test the battery (para 2-8).

c. Remove headsets and microphone from compartment in case lid and plug into their corresponding jacks. Two headsets may be used simultaneously.

d. Set the AM-CW switch to CW and the REC-SEND switch to SEND.

e. Set the LOADING control to "1" and the IND SENS switch to "1." Set the transmitter CHANNEL to the desired channel.

f. Hold down the internal telegraph key and advance the LOADING control to a point which provides maximum brilliance of the ANT INDICATOR lamp. If necessary advance the IND SENS switch to "2" or "3" to secure a visible lamp indication.

g. Leave the LOADING control in the position which provides maximum brilliance of the ANT INDICATOR lamp and turn the IND SENS switch to OFF. Release the internal telegraph key.

3-6. Operating in the CW Mode

(fig. 3-1)

NOTE

Prior to performing the steps listed in *a* and *b* below, insure that proper antenna loading has been obtained in accordance with paragraph 3-5.

a. Transmitting.

(1) Set REC-SEND switch to SEND.

(2) Set the AM-CW switch to CW.

(3) Set the transmitter CHANNEL switch to the desired channel.

(4) Key the message with the internal telegraph key. If an external key or keyer is to be used, remove the plug from the KEY jack and plug the external key jack in its place.

(5) As you key the message, listen in the headset for a sidetone of the keying which will allow you to hear your own transmission and will indicate also that the message is being transmitted.

(6) If it is desired to change to another channel, repeat the loading procedure (para 3-5*e* through *g*). Also check the antenna length (para 3-3).

b. Receiving.

(1) Set the REC-SEND switch to REC.

(2) Set the receiver CHANNEL switch to the desired channel.

(3) Set the BW switch to .5 KC.

(4) Turn on the GAIN CONTROL and advance clockwise for comfortable listening level.

(5) Turn the BFO control clockwise and advance for desired tone of code message being received.

(6) Do not change LOADING control from transmitter setting.

3-7. Operating in the AM Mode

(fig. 3-1)

NOTE

Prior to performing the steps listed in *a* and *b* below, insure that proper antenna loading has been obtained in accordance with paragraph 3-5.

a. Transmitting.

(1) Set REC-SEND switch to SEND.

(2) Set AM-CW switch to AM.

(3) Set the transmitter CHANNEL switch to the desired channel.

(4) Plug in the microphone in the MIKE jack.

(5) Set the WHISPER switch to OUT.

(6) Hold the microphone close to the lips and talk at normal speech volume. If it is desired to speak at low volume because of the tactical situation, set the WHISPER switch to IN.

(7) The sound of your voice in the headset indicates that the message is being transmitted.

(8) Set LOADING control as specified in paragraph 3-5*g*.

b. Receiving.

(1) Set the REC-SEND switch to REC.

(2) Set the receiver CHANNEL switch to the desired channel.

(3) Turn the BFO control completely counterclockwise to its OFF position.

(4) Set the BW switch to 6.0 KC.

(5) Advance the GAIN CONTROL clockwise for comfortable listening level in the headset.

3-8. Receiving Single Sideband (Ssb) Messages

NOTE

Prior to performing the steps listed in *a* and *b* below, insure that proper antenna loading has been obtained in accordance with paragraph 3-5.

Single sideband is a special transmitting technique which can be received by the AN/PRC-64A, but cannot be transmitted by it. To receive a single sideband message, perform the following steps:

a. Set the receiver for am reception (para 3-7*b*).

b. Turn the BFO control on and advance very

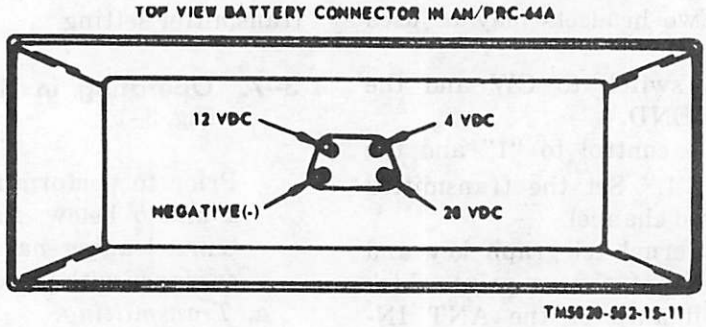


Figure 3–3. Connection diagram, external power sources.

slowly until the voice message becomes intelligible. It may be necessary to advance the BFO control over its full range to find the point of best reception. Also try the BW switch in the 0.5-KC position since ssb transmissions have narrow bandwidth. Voices on ssb may not sound natural; however, this is due to the narrow bandwidth and the method of reception using the BFO control.

3–9. Stopping Procedure

a. Set REC–SEND switch to REC.

b. Set receiver GAIN CONTROL to OFF.

c. Remove antenna connections from ANT and GND connections.

d. Remove headsets and microphone from jacks and place headsets and microphone assemblies in cover compartment; close and lock compartment.

e. Open pressure valve and close cover. Lock turn-buckle fasteners and close pressure valve.

f. Roll up antenna components on their respective reels.

g. Place all components in the carrying bag.

Section III. OPERATION UNDER UNUSUAL CONDITIONS

3–10. Operating Procedure Under Arctic Conditions

In very cold temperatures the battery may be very inefficient and be unable to supply sufficient power. Keeping the battery inside the clothing, next to the body until ready for use, will assure sufficient warmth for proper operation for short periods of time. While one battery is being used, a spare battery may be kept next to the body.

3–11. Use of External Power Sources

CAUTION

If substitute power sources are employed, be careful to avoid reversed polarity. Improper connections can cause serious damage to the radio set.

a. Under emergency conditions when no battery is available, direct current (dc) sources of power may be used. Figure 3–3 shows connections and necessary power required. A socket from a discarded battery will make a suitable connector.

b. If only the receiver is used, a 4-volt supply such as furnished by a combination of flashlight cells producing the proper voltage can be used.

3–12. Recognition and Identification of Jamming

It is likely that under real or simulated tactical conditions the receiver of the radio set will be jammed by the enemy. Enemy jamming is done by transmitting a strong signal on the same frequency as that used for communication, thereby making it difficult or impossible to receive the desired signal. Unusual noises or strong interference heard on the receiver may be enemy jamming, signals from a friendly station, noise from a local source, or the receiver may be defective. To determine whether or not the interference is originating in the receiver, disconnect and remove the antenna leads, or short the ANT post to the GND post. If the interference *continues,* the receiver is defective. Enemy jamming signals may be typed as *continuous wave* or *modulated.* A jamming signal may be intended to block a single frequency. This is called *spot* jamming. The enemy may use one or several transmitters to jam a block or band of frequencies. This method is called *barrage* jamming.

a. Continuous-Wave Jamming. Cw jamming is

transmitted as a steady carrier. This signal beats with another signal and produces a steady tone in the headset. Cw jamming signals may also be keyed by using a random on-and-off signal or using actual code characters keyed to the same rate or a little faster than the signal being received.

b. Modulated Jamming. Modulated jamming signals may consist of noise, laughter, singing, music, various tones, or any unusual sound, or it may be a combination of these sounds. Various types of modulated jamming signals are explained below.

(1) *Spark.* This is one of the simplest, most effective, and most easily produced jamming signal. This type of signal sounds very rough, raspy, and sometimes like an operating electric motor with sparking brushes. This type of signal is very broad; therefore, it will interfere with a large number of communication channels.

(2) *Sweep-through.* This signal is the result of sweeping or moving a carrier back and forth across your frequency at a slow or rapid rate. The numerous signals of varying amplitude and frequency produce a sound like that of a low-flying airplane passing overhead. This type of jamming is effective over a broad range of frequencies. When it is varied rapidly, it is effective against all types of voice signals.

(3) *Stepped tones or bagpipes.* This signal usually consists of several separate tones. The tones are transmitted in the order of first increasing and then decreasing pitch, repeated over and over. The audible effect is like the sound of a Scottish bagpipe.

(4) *Noise.* Noise is random both in amplitude and frequency. It produces a sound similar to that heard when a receiver is not tuned to a station and the volume or gain control is turned to maximum.

(5) *Gulls.* This signal consists of a quick rise and slow fall of a variable audiofrequency. The sound is similar to the cry of the sea gull.

(6) *Tone.* This signal consists of a single audiofrequency of unvarying tone. It produces a steady howl in the headset. Another use of tone is to vary it slowly. This produces a howling sound of varying pitch.

3–13. Antijamming Procedures

When it is determined that the incoming signal is being jammed, the operator will notify the immediate superior officer and continue to operate the equipment. To provide maximum intelligibility of jammed signals, follow one or more of the operational procedures below. If these procedures do not provide sufficient signal separation for satisfactory operation, change to an alternate frequency.

a. Operate the receiver as outlined in paragraphs 3–5 through 3–8.

b. If possible, have the transmitting station switch to another channel or change the mode of transmission from am to cw.

c. Vary the receiver GAIN CONTROL. This may reduce the volume of the jamming signal enough to permit the weaker desired signal to be heard.

d. Change the setting of the BW switch. The change in bandwidth may cause the signal to be more intelligible.

e. Change the antenna direction, which may cause a reduction in the jamming signals.

CHAPTER 4

OPERATOR'S MAINTENANCE INSTRUCTIONS

4-1. Scope of Operator's Maintenance

The maintenance duties assigned to the operator of the AN/PRC-64A consist of operational checks. Troubleshooting and maintenance are performed by organizational or higher maintenance level personnel.

4-2. Operator's Preventive Maintenance

Operator's preventive maintenance is the systematic care, servicing, and inspection of equipment to prevent the occurrence of trouble, to reduce downtime, and to insure that the equipment is serviceable.

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

b. Maintenance and Service Inspection. The preventive maintenance checks and services chart (para 4-4) outlines functions to be performed at specific intervals. These checks and services are designed to maintain Army electronic equipment in combat-serviceable condition; that is, good general (physical) condition and in good operating condition. To assist operators in maintaining combat serviceability, the chart indicates what to check, how to check, and the normal conditions; the *References* column lists the illustration or paragraph that contains instructional information or detailed repair and replacement procedures. If the defect cannot be remedied by the operator, higher category of maintenance or repair is required. Records and reports of these checks and services must be made in accordance with the requirements set forth in TM 38-750.

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

Operator's preventive maintenance checks and services of the AN/PRC-64A required daily. Paragraph 4-4 specifies the checks and services that must be accomplished daily and under the conditions listed below.

a. Before the equipment is used when starting on a mission.

b. When a mission is completed.

c. At least once each week if the equipment is kept in a standby condition.

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

Item No.	Item to be inspected	Procedure	References
1	Exterior surfaces	Clean the entire surface of all items of the radio set	Fig. 1-2, para 4-5
2	Carrying bag	Check for tears, missing straps, or holes in fabric	Fig. 1-2
3	Antenna reels	Check for bent reels or broken wire	Para 1-5
4	Transmission line reel	Check for bent reels, broken wire, and missing binding post caps on terminal block.	Para 1-5
5	Headsets	Check for broken cord assemblies, damaged earphones, and bent earpieces.	Fig. 1-2
6	Microphone	Check for broken cord, damaged or missing microphone holder	Fig. 1-2
7	Exterior of case	Check operation of valve and turnbuckle fasteners	Fig. 1-2
8	Knobs	Examine each knob for tightness on shaft. Tighten with socket head key clipped on lid of storage cover, if necessary.	Fig. 3-1
9	KEY connector	Check to be sure connector is in place and locked	Fig. 3-1
10	Battery	Test battery	Para 2-8
11	Operational test	Using another AN/PRC-64A or other suitable transceiver, make an operational test.	Paras 3-5 through 3-7.

4-5. Cleaning

Inspect the exterior surfaces of the Radio Set AN/PRC-64A. The exterior surfaces should be free of dust, dirt, grease, and fungus.

a. Remove dust and dirt with a clean, soft cloth.

WARNING

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

b. Remove grease, fungus and ground-in dirt from the radio set; use a cloth dampened (not wet) with cleaning compound (FSN 7930-395-9542).

c. Remove dust and dirt from knobs, switches, plugs, jacks, and receptacles.

CHAPTER 5

ORGANIZATIONAL MAINTENANCE

5-1. Scope of Organizational Maintenance

a. This chapter covers organizational maintenance including the changing of the radio set battery. Instructions are also provided for replacing knobs, indicator lamps antenna, headset, and microphone. No lubrication of the equipment is required.

b. Organizational maintenance includes—

(1) Preventive maintenance (para 5-4).

(2) Replacement of control knobs (para 5-8).

(3) Replacement of battery (para 2-8).

(4) Replacement of indicator lamps (para 5-10).

(5) Replacement of antenna components (para 5-11).

(6) Replacement of microphone and headset components (paras 5-12 and 5-13).

(7) Replacement of carrying case.

(8) Touch up painting.

(9) Troubleshooting by use of organizational troubleshooting chart (para 5-6).

5-2. Tools, Materials and Test Equipment Required

a. Cleaning compound (Federal stock No. 7930-395-9542).

b. Cleaning cloth.

c. Toolkit, Electronic Equipment, TK-101/G.

d. Multimeter AN/URM-105 (TM 11-6625-203-12).

5-3. Organizational Monthly Maintenance

Organizational preventive maintenance is the systematic care and inspection of equipment to maintain it in serviceable condition, prevent breakdown, and insure maximum operational capability. Preventive maintenance is the responsibility of all categories concerned with the equipment. It includes inspection, testing, and repair or replacement of parts that inspections and tests reveal would probably fail before the next scheduled periodic service. Preventive maintenance checks and services of the radio set at the organizational category of maintenance are made at monthly intervals unless otherwise directed by the commanding officer. Perform the maintenance functions indicated on the monthly preventive maintenance checks and services chart (para 5-4) once each month. A month is defined as approximately 30 calendar days of 8-hour per day operation. If the equipment is operated 16 hours a day, the monthly preventive maintenance checks and services should be performed at 15-day intervals. Adjustment of the maintenance interval must be made to compensate for any unusual operating conditions. Equipment maintained in a standby (ready for immediate operation) condition must have monthly preventive maintenance checks and services performed on it. Equipment in limited storage (requiring service before operation) does not require monthly preventive maintenance.

5-4. Organizational Monthly Preventive Maintenance Checks and Services Chart

Sequence No.	Item to be inspected	Procedure	References
1	Completeness	Insure that the equipment is complete	Para 1-6*a*
2	Preservation	Check all surfaces for evidence of fungus. Remove rust spots and corrosion and spot paint any bare spots.	Para 5-5
3	Publications	Insure that all publications are complete, serviceable, and current.	DA Pam 310-4
4	Modifications	Check DA Pam 310-7 to determine if new applicable MWO's must be applied. All MWO's must be applied.	TM 38-750 and DA Pam 310-7.
5	Radio set	Operational checks are covered in operator's daily preventive maintenance checks and services chart.	Para 4-4

5-5. Touchup Painting

Clean all damaged surfaces of the equipment. Touch up the damaged paint on metal surfaces. For detailed cleaning and refinishing practices, refer to TB 43-0118.

5-6. Organizational Troubleshooting

The following troubleshooting chart is based upon the operational check in paragraph 4-4.

Item No.	Trouble symptom	Probable trouble	Checks and corrective measures
1	BAT TEST lamp does not light during battery test.	*a.* Defective battery *b.* Defective lamp	*a.* Replace battery (para 2-8). *b.* Replace lamp (para 5-10).
2	ANT INDICATOR lamp does not light during loading procedure.	a. Broken antenna, counterpoise, or transmission line *b.* Defective lamp	*a.* Replace faulty component (para 5-11). *b.* Replace lamp (para 5-10).
3	No am transmission sidetone heard or heard by companion receiver used in test.	Defective microphone component	Replace microphone (para 5-13).
4	No sound heard in headphone during transmission from companion transmitter being used in test.	Defective headset	Try second headset; replace defective component (para 5-12).

5-7. Repair

The components listed in paragraph 1-6*a* are the items of the AN/PRC-64A that may be replaced by organizational personnel. Instructions for these repairs are given in paragraphs 5-8 through 5-12.

5-8. Replacement of Control Knobs

a. Use the socket head key located on the accessory compartment cover of the case lid to loosen setscrew in defective knob.

b. Replace knob, and tighten setscrew.

c. Check operation of knob to be sure it indexes properly.

5-9. Replacement of Battery

See paragraph 2-7.

5-10. Replacement of Indicator Lamps

a. Unscrew defective lamp assembly.

b. With fingernails or knife blade loosen lamp base from assembly, and pull out lamp, base first.

c. Replace correct lamp in lamp assembly and screw assembly back into place.

d. Repeat test to be sure lamp functions correctly.

NOTE

As a further check the removed lamp can be tested with the X1 resistance scale *only* of the AN/URM-105.

5-11. Test and Replacement of Antenna Components

a. Antenna components may be tested for continuity with the AN/URM-105. Use the X1 resistance scale. If the infinite resistance (open circuit) is indicated, replace the faulty component. Each conductor of the transmission line should be tested in this manner.

b. If test in *a* above indicates no open circuit, check antenna and transmission line for proper length:

(1) The antenna and counterpoise wires should be approximately 96 feet.

(2) The transmission line should be approximately 35 feet.

5-12. Testing and Replacement of Headset Components

a. Check the earphone by substitution with a known good earphone. Interchange of earphones from one headset to the other may be desirable. The headset cord assembly may be tested in the same way. If difficulty is encountered that cannot be corrected by simple replacement of headset components, refer item to higher level of maintenance personnel.

b. Replace faulty or intermittent components.

5-13. Replacement of Microphone

a. Test the microphone by substituting a known good microphone.

b. Replace faulty or intermittent microphone.

CHAPTER 6

FUNCTIONING OF EQUIPMENT

6-1. Block Diagram, AN/PRC-64A
(fig. 6-1)

a. Radio Set AN/PRC-64A is a battery operated, crystal controlled, radio transceiver which operates in the frequency range of 2.2 to 6.0 megahertz. It receives amplitude modulated (am), single sideband (ssb) voice transmissions and continuous wave (cw) radio telegraph code transmissions. It also transmits am voice or cw code. Operating frequency is determined by crystals installed in both transmitter and receiver and by the setting of the receiver and transmitter channel selection switches. The AN/PRC-64A is housed in a waterproof case which contains the radio set, headphones, microphone, alignment tools, and spare parts. The case is carried in a carrying bag which also contains reels of antenna wire, counterpoise wire, and transmission line.

b. A block diagram of the AN/PRC-64A is shown in figure 6-1. The receiver and transmitter are separate assemblies which plug into the battery test, modulator, and matching network assembly (main chassis networks). This assembly is part of the top plate assembly and contains controls used for switching operating modes, loading the antenna, testing the battery, and providing connection to external devices.

6-2. Transmitter Assembly
(fig. 6-2 and 7-26)

a. The transmitter functional section contains the components shown in figure 6-2, along with switching and interwiring of the main chassis networks of the AN/PRC-64A. The crystal-controlled frequency selected by switching to one of four channels is set up in the RF oscillator circuit with control of the oscillator effected by the oscillator control assembly. The RF signal produced and the modulated audio or keyed signal are applied to the RF driver stage. The carrier signal is modulated further in the driver with the signal determined by the driver tuned circuit. The signal receives final amplification and tuning in the RF power amplifier and is applied to the antenna for radiation. The tunable circuits in the transmitter section are mechanically linked to the channel selector control knob located on the front panel of the AN/PRC-64A.

b. In order to prevent oscillator operation with the key up, the oscillator control circuit, contained on an auxiliary circuit board attached to top of plate holding final amplifier coils, is connected to the oscillator (fig. 7-26). When the key is depressed, keyed voltage is fed through CR3 and resistor R11 to apply reverse bias to CR2, effectively simulating an open circuit, and allowing the oscillator to operate. When the key is released, a short period of time is required for C34 capacitor to discharge through resistor R10. After this has occurred, CR2 appears as a short circuit between the base of Q1 and ground, stopping the oscillations. During normal keying, C34 capacitor retains enough charge to keep the oscillator in operation except during a long pause as at the end of a word. During periods of oscillator operation, keying takes place by application and removal of the dc supply voltage at the collector of the transistor in the RF driver amplifier. This permits keying at rates up to 300 wpm without chirping due to crystal starting and stopping.

c. Capacitive coupling is used between the oscillator and the driver, using Q2 transistor as a common emitter amplifier. Diode CR1 between the oscillator and driver stage is used as a switch to provide additional percentage for am operation. An "L" network tunes the collector circuit to resonance for each channel. This type of tuning network provides a high input impedance for the collector load and a low output impedance to drive the succeeding stage. The diode and the driver stage are supplied with modulated or keyed voltage.

d. Trifilar toroidal transformer T1 provides coupling to the emitters of the push-pull output stage which uses a pair of transistors in a common base configuration. Another trifilar toroidal

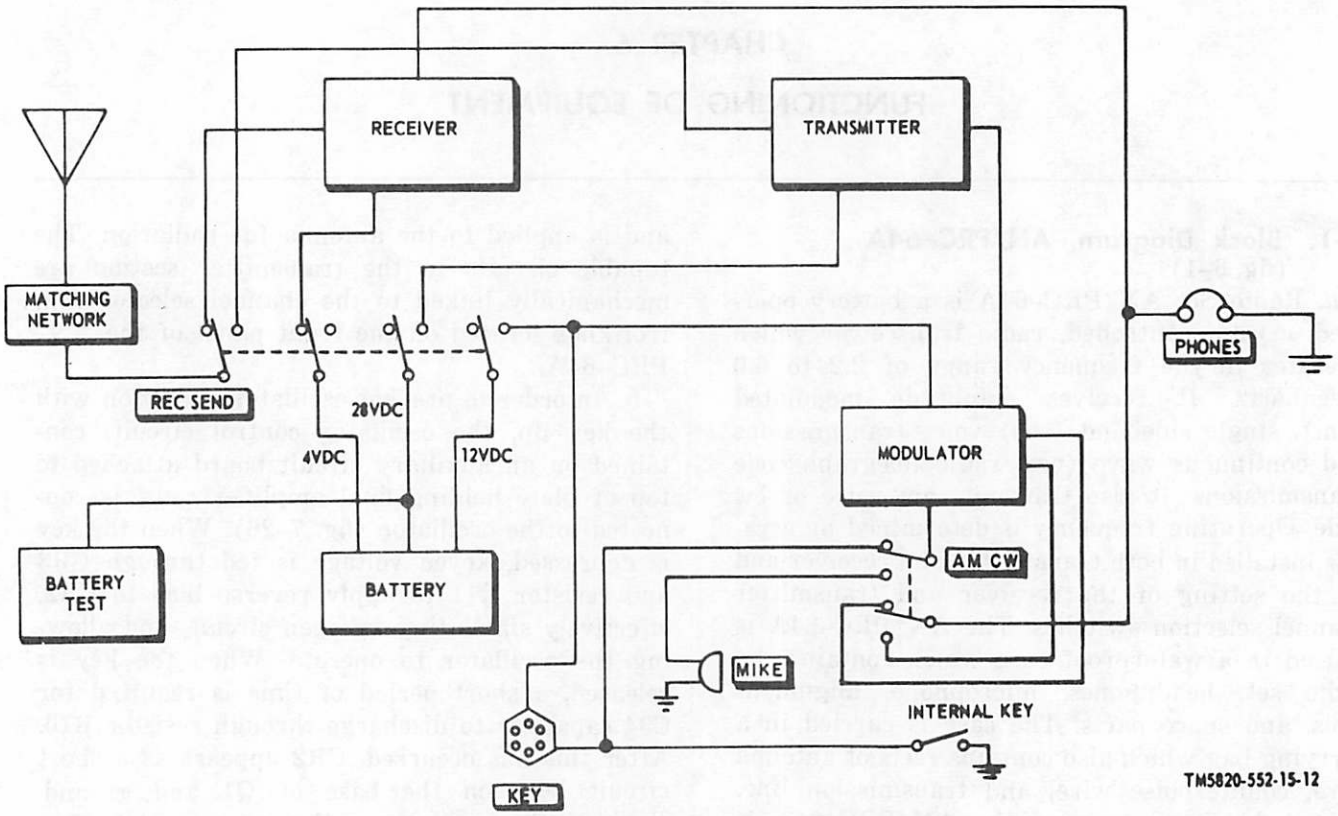


Figure 6-1. Block diagram, Radio Set AN/PRC-64A.

transformer T2 couples the output power from the collectors into the output tuned circuits, which is a hybrid between a series tuned circuit and an "L" network, used to provide off-tune collector current and high harmonic attenuation.

6-3. Receiver Assembly
(figs. 6-3 and 7-25)

a. This assembly is a single-conversion superheterodyne receiver designed for reception of am or cw signals at fixed frequencies controlled by four crystal oscillators. The simplified signal path is shown in the block diagram (fig. 6-3).

b. First RF amplifier Q1 operates with tuned circuits at both the base and collector (fig. 7-25). Two diodes CR1 and CR2 are used to protect the first RF amplifier from overload. Second RF amplifier Q2 is resistance-capacity coupled to the base of the mixer Q4. Crystal oscillator Q3, operating 455 kHz above the received signal, also is resistance-capacity coupled to the base of mixer Q4. The mixer output frequency of 455 kHz is selected by the tuned circuit consisting of L7 and C28. The IF signal is coupled through C27 to the base of first IF stage Q5 operating at a frequency of 455 kHz. A filter (either a 0.5-kHz mechanical filter or a 6.0-kHz ladder filter selected by a panel-mounted switch) shapes the IF selectivity properly at the input to second IF Q6 which drives detector CR3. Another diode CR4 furnishes temperature-compensated forward bias for the detector.

c. When BFO switch S3 is set to BFO, the output of the beat frequency oscillator (BFO) stage Q9 is coupled through C43 and mixed with incoming IF signals in Q6 to produce an audio beat note for cw or single sideband operation. A tuning coil in the BFO coil provides course frequency adjustment.

d. The output of the second IF amplifier Q6 is also applied to the automatic gain control (agc) amplifier Q7. The agc voltage developed across C30, R25, and C31 is applied to the RF amplifier and to the first IF stage. The agc amplifier is disabled when the BFO switch S3 is closed. The audio output from the detector

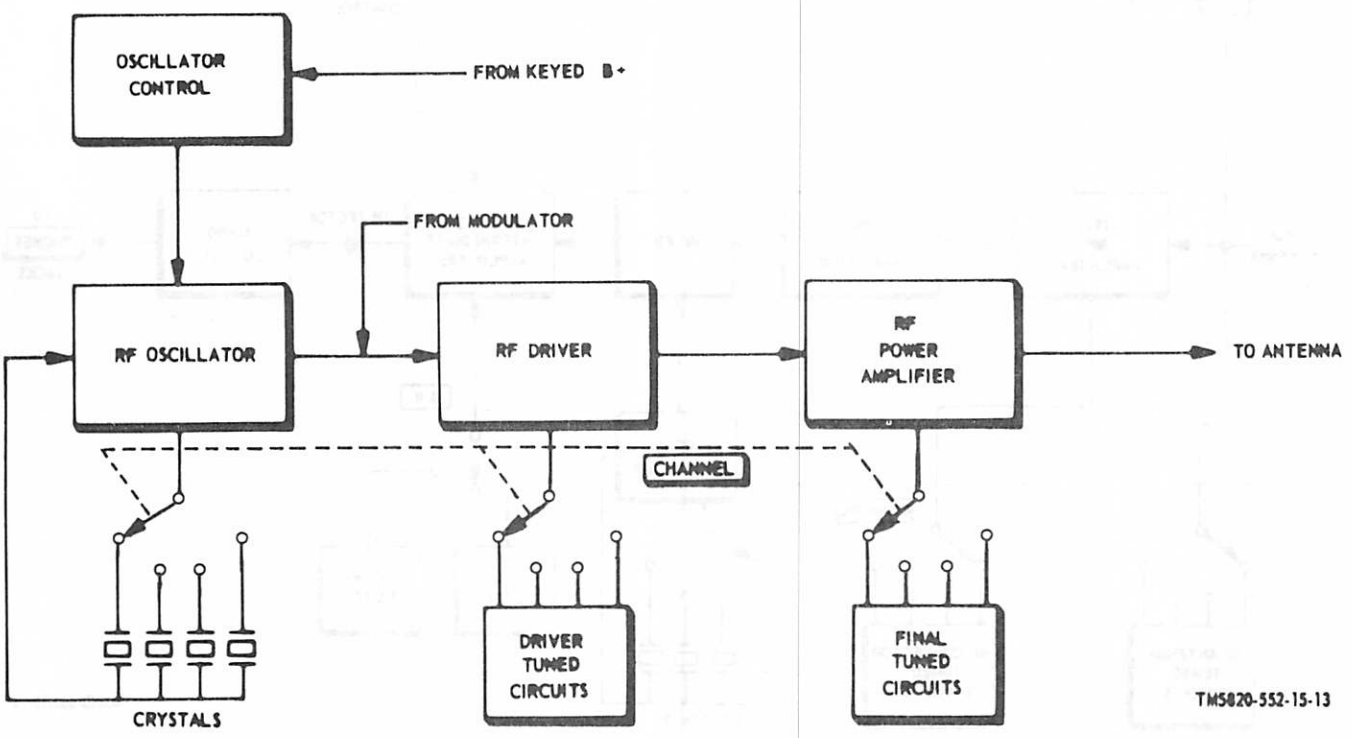


Figure 6–2. Block diagram, transmitter assembly.

stages employs a DS–46 silicon circuit and is amplified by amplifiers Q8 and Q10. Direct coupling is used between stages, while a shunt feed choke is used on the output stage. A combination of ac and dc feedback is utilized to provide stability.

e. The receiver operates from a 4-volt tap on the battery. Current drain is 13 ma in standby. Since transmitter current may be as much as 800 ma, this battery drain is negligible.

6–4. Main Chassis Networks
(figs. 6–4 and 7–27)

a. Power Supply Control. The REC–SEND switch performs the following functions—in the REC position, the antenna and the 4-volt supply are connected to the receiver. In the SEND position, the antenna and the 28-volt supply are connected to the transmitter, while the 12-volt supply is connected to the speech amplifier and the KEY socket.

b. Antenna Circuit. The antenna LOADING control and the ANT. INDICATOR lamp are in the antenna circuit regardless of the position of the REC–SEND switch. A pair of IN676 diodes, CR2 and CR3, across the lamp provide protection against overload when the transmitter is adjusted.

c. Audio Amplifier and Modulator-Keyer. When the REC–SEND switch is in the SEND position, +12 volts from the battery is applied to the two-stage audio amplifier, which is used as a speech amplifier for am and a sidetone oscillator for cw operation. For am operation, the audio output from the speech amplifier is connected to the base circuit of the keyer transistor Q3, which controls the collector voltage of the transmitter driver stage. Potentiometer R28 sets the bias on Q3, thus controlling the transmitter RF power on am and, consequently, setting the positive and negative modulation peaks.

d. Speech Amplifier Circuit. The output of the 1900-ohm magnetic microphone is amplified by the speech amplifier consisting of Q1 and Q2 with R–C interstage coupling and a transformer in the output. The WHISPER switch provides a 7-to-13 db change of gain by changing the value of the emitter resistor in the second stage of the audio amplifier. A portion of the audio output is fed to the headphone circuit for sidetone.

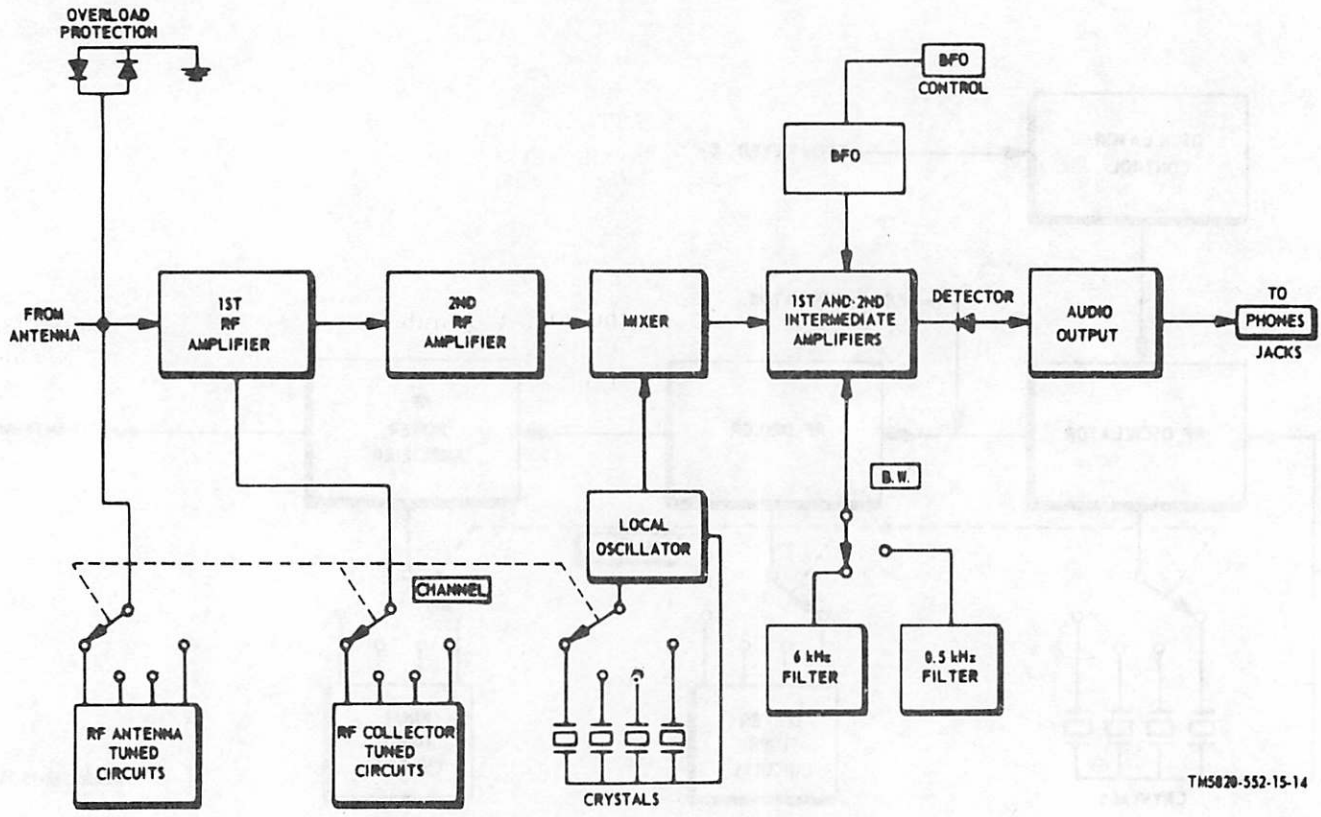


Figure 6-3. Block diagram, receiver assembly.

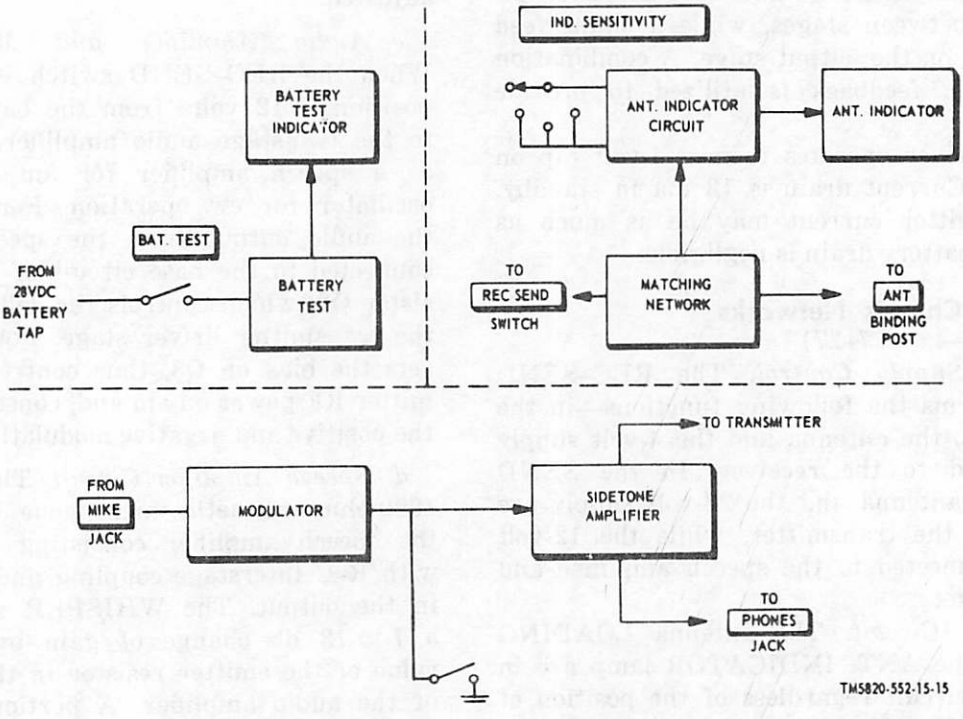


Figure 6-4. Block diagram, main chassis networks.

e. CW Operation. For cw operation, the transformer secondary of T1 is short circuited. The voltage drop across R17 provided by the crystal oscillator drain is utilized for reverse bias to obtain complete current cutoff of Q3 with the key up. With the AM–CW switch in the CW position, the key controls Q3. Also, a feedback circuit consisting of R2 and C3 is switched in to cause the amplifier to oscillate at an audiofrequency when Q3 conducts. The resulting tone is used as a keying sidetone.

f. Battery Tester. When the BATTERY TEST switch, S4, is pressed, R16, a 100-ohm load resistor, is connected across the battery and voltage is applied through R19 and R20 to CR1, an 18-volt Zener diode in the base circuit of transistor Q4. If the battery voltage is sufficient to cause Zener breakdown, transistor Q4 conducts and causes the BAT TEST indicator to glow. The voltage across the lamp cannot exceed 1 volt because diodes CR5 and CR6 conduct the excess current which would otherwise overload the lamp and cause burnout at higher battery voltages. Since the drop across R19 and R20 in series is approximately 2 volts at 20 volts input, the lamp will light at any voltage above 20 volts. Brilliance at higher voltages will be nearly constant due to the limiting action of the diodes.

CHAPTER 7

GENERAL SUPPORT MAINTENANCE

Section I. GENERAL

7-1. Scope of General Support Maintenance

General support maintenance of Radio Set AN/PRC-64A covers inspection, testing, servicing, adjusting, aligning, installation of crystals, and the repair of the radio set or its assemblies. This chapter covers, in order, troubleshooting, alignment, removal and replacement, repair, and testing procedures for repaired equipment.

7-2. Tools and Test Equipment

The following tools and test equipment are required for general support maintenance. The list includes a number of special test leads which should be fabricated from the indicated materials, as shown in figure 7-1.

Item	*Federal stock number*	*Technical manual*
Signal Generator AN/GRM-50	6625-868-8353	TM 11-6625-573-15
Power Supply PP-3514/U	6625-445-6933	TM 11-6625-617-12
Power Supply PP-3940/G	6130-985-8136	TM 11-6130-247-15
Wattmeter AN/URM-120	6625-813-8430	TM 11-6625-446-15
Digital Readout Electronic Counter AN/USM-207	6625-543-1357	TM 11-6625-700-10
Voltmeter, Meter ME-30A/U	6625-669-0742	TM 11-6625-320-12
Multimeter TS-352/U	6625-242-5023	TM 11-6625-366-15
Audio Power Meter TS-585/U	6625-244-0501	TM 11-5017
Oscilloscope (Optional)		
Signal Generator AN/USM-205	6625-788-9672	TM 11-6625-665-15
Chassis extension adapter consisting of:		
1—Connector, Cinch DE-9S		
1—Connector, Cinch DE-9P		
Wire, stranded AWG No. 22		
Power test adapter, consisting of:		
1—Connector UG-23B/U	5935-149-3885	
1—Resistor, noninductive, 50 ohms, 20 watts		
Test cable No. 1, consisting of:		
1—Connector from battery BA-1509/PRC-64		
4—Clip, electrical, alligator style	5940-186-9833	
Wire, stranded, AWG No. 22		
Test Cable No. 2 (2 required) consisting of:		
1—Connector UG-88/U	5935-149-4066	
2—Clip, electrical, alligator style	5940-186-9833	
Cable, coaxial RG-58A/U	6625-230-5505	
Test cable No. 3, consisting of:		
1—Subminiature phone plug		
2—Clip, electrical, alligator style	5940-186-9833	
Cable, coaxial RG-188A/U	6625-230-5825	
Test cable No. 4, consisting of:		
1—Connector UG-18B/U	5935-149-3983	
2—Clip, electrical, alligator style	5940-186-9833	
Cable, coaxial RG-58A/U	6625-230-5505	
Test cable No. 5 consisting of:		
"T" Connector UG-274/U	5935-149-3561	
Cable, coaxial RG-58A/U	6625-230-5505	

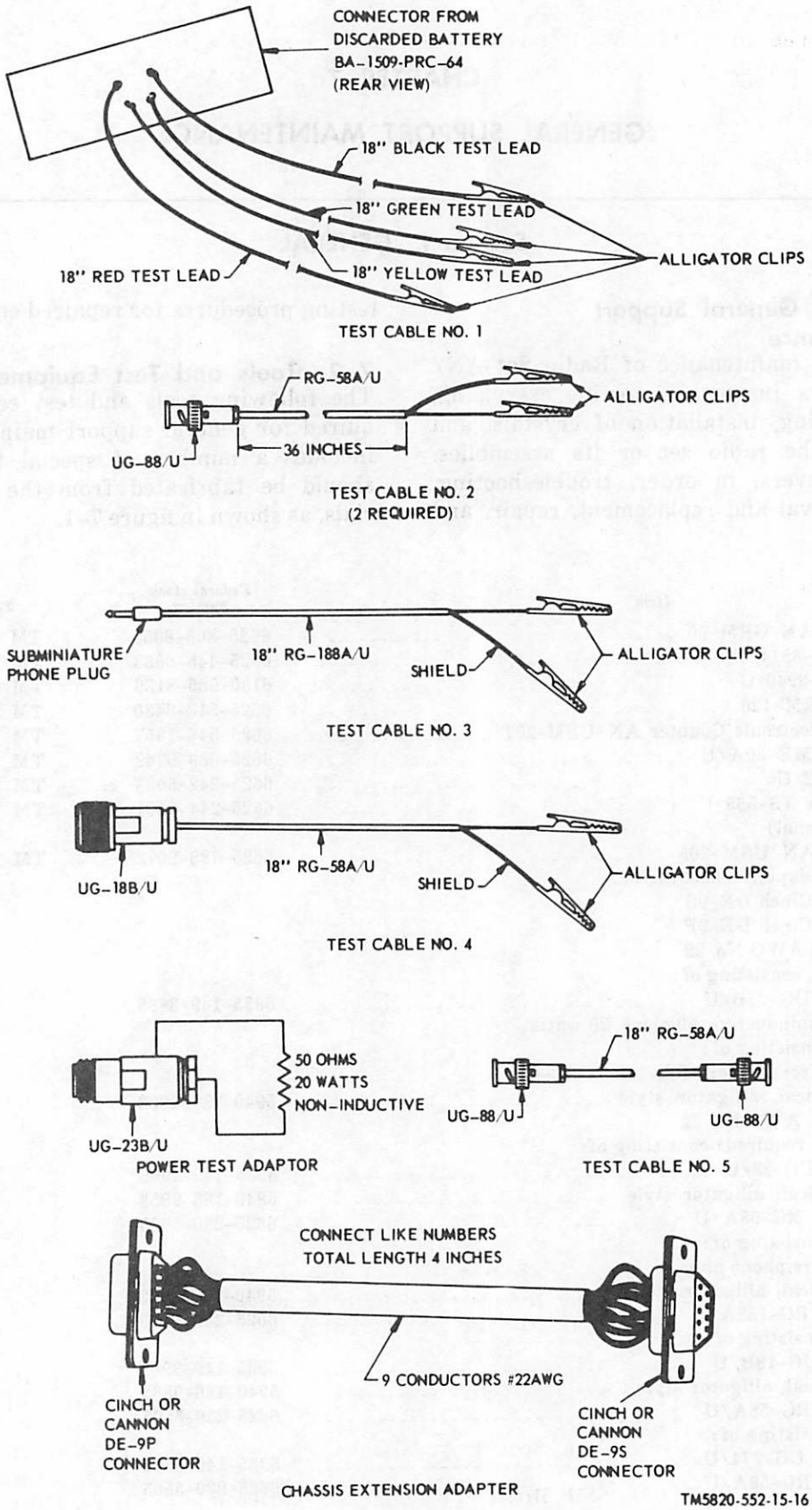


Figure 7-1. Special test cables, construction details.

Section II. TROUBLESHOOTING

7-3. Organization of Troubleshooting

a. General. The first step in troubleshooting the AN/PRC-64A is to determine which units are not operating correctly. The receiver may be operating, but the transmitting section is inoperative. A receiver or transmitter may function properly on three of the four channels. Or the transmitter may operate correctly on am, but fail to function on cw. Common complaints may also include weak transmission or reception, or completely inoperative equipment.

b. Operational Tests. Operational tests frequently indicate the general location of trouble. In many instances the tests will help determine the exact nature of the fault. See paragraph 4-4.

c. Visual Inspection. Obvious faults such as broken battery connector pins, loose or broken antenna binding post, broken switches, or loose crystals can be determined from visual inspecon.

d. Troubleshooting Chart. The troubleshooting chart (para 7-4) provides additional information for locating troubles. Trouble symptoms listed in the chart are subdivided into operational components for ease in troubleshooting.

e. Removal of Components. Removal of the top plate assembly from the case and the removal of assemblies may be required for troubleshooting. Instructions for removal are given in paragraphs 2-5*b* and 7-10. When removed, the receiver and transmitter assemblies can be reconnected to the top plate assembly by using the chassis extension adapter shown in figure 7-1.

f. Power Requirements. Troubleshooting can be done with a known good battery, or external supplies. For most accurate results with voltage measurements, use the two power supplies listed in paragraph 7-2. All resistance measurements are to be made *without* power connected to the AN/PRC-64A.

7-4. Troubleshooting Chart

Item No.	Symptom	Probable trouble	Corrective action
		COMBINED RECEIVER AND TRANSMITTER TROUBLES	
1	Transmit and receive modes inoperative.	*a.* Weak or dead battery	*a.* Test battery. Replace battery, as required.
		b. Broken conductor	*b.* Check continuity in wiring harness (fig. 7-28).
		c. Broken REC-SEND switch S1	*c.* Replace switch SL.
		d. Defective LOADING control L2	*d.* Replace control L2.
		e. Faulty interlock switch S2	*e.* Check voltages through interlock switch S2.
2	Weak transmit and receive	*a.* Weak battery	*a.* Test battery. Replace battery, as required.
		b. Defective antenna; open or loose antenna lead.	*b.* Check antenna components for continuity. Replace broken antenna wires. Repair antenna lead.
		c. Open resistor in matching network, board A4A1.	*c.* Make resistance checks of resistors R22, R23, R24 and R25 in assembly A4A1.
		RECEIVER TROUBLES (TRANSMITTER OK)	
3	Receiver dead on all channels	*a.* 4.0-volt section of battery dead	*a.* Replace battery.
		b. Defective REC-SEND switch S1	*b.* Replace switch SL.
		c. Defective interlock switch S2	*c.* Make continuity check of contacts 1 and 2 (green wires, 4.0-volt section) of interlock switch S2. Replace switch as required (fig. 7-27).
		d. Receiver circuit fault	*d.* Make voltage and resistance checks on receiver (para 7-6).
		e. Broken PHONES jack conductor or bad earphone.	*e.* Make continuity tests of wiring harness PHONES jack conductors.

Item No.	Symptom	Probable trouble	Corrective action
		f. Broken GAIN CONTROL switch	*f.* Make continuity test on switch. Replace switch as required.
4	Receiver output signal weak on one channel.	*a.* Missing or faulty crystal in dead channel.	*a.* Install or replace crystal.
		b. Faulty CHANNEL switch	*b.* Replace switch.
		c. Faulty antenna or collector coil corresponding to dead channel.	*c.* Make voltage and resistance checks of Q1 on upper board assembly A4A7A2 (para 7-6). Also check antenna and collector coils corresponding to dead channel.
5	Normal rushing noise heard in earphone but signals not heard on any channels.	*a.* Circuit fault	*a.* Make complete receiver voltage and resistance measurements as required (para (7-6).
		b. Improper alignment	*b.* Realign receiver af and IF sections (paras 7-12 and 7-13).
6	Weak am reception; cw reception OK.	*a.* BW switch defective	*a.* Check switch continuity; replace switch as required.
		b. Bad FL1 filter	*b.* Replace FL1.
7	Heterodyne tones heard on am reception.	Faulty BFO control switch	Check switch for continuity. Replace switch as required.
8	No tone heard on cw signals	*a.* Faulty BFO control, L10 or C45 on lower board assembly A4A7A1A1.	*a.* Replace BFO control. Check L10 for continuity. Replace C45. Replace L10.
		b. Defective Q9 or associated component.	*b.* Make voltage and resistance measurements on Q9 (para 7-6).
		c. Improper BFO alignment	*c.* Align BFO (para 7-13).
		d. Open or defective F12 filter	*d.* Replace F12.
9	Signal received but audio distorted.	*a.* Defective Q8, Q10 or associated component.	*a.* Make voltage and resistance measurements on Q8 and Q10 (para 7-6).
		b. Faulty headset	*b.* Try other headset. Replace defective earphone or headset.
10	Receiver weak on all channels; battery OK.	*a.* Misaligned IF section	*a.* Align IF section.
		b. Circuit fault	*b.* Make complete receiver voltage and resistance measurements (para 7-6).
		TRANSMITTER TROUBLES (RECEIVER OK)	
11	Transmitter dead on all chanels	*a.* 28-volt or 12-volt sections of battery dead.	*a.* Replace battery.
		b. Defective REC-SEND switch	*b.* Replace switch.
		c. Defective interlock switch	*c.* Check 28 v and 12 v sections of interlock switch. Replace switch, as required.
		d. Transmitter or modulator circuit fault.	*d.* Make voltage and resistance measurements on transmitter, and main chassis networks (para 7-8).
		e. Faulty AM-CW switch or switch wiring.	*e.* Make continuity checks. Replace switch or broken conductors.
12	Transmitter dead on one channel.	*a.* Missing or faulty crystal	*a.* Install or replace crystal.
		b. Faulty CHANNEL switch	*b.* Replace switch.
		c. Faulty driver or power amplifier coil.	*c.* Replace defective coil.
13	No cw transmission with internal key; Am transmission OK.	*a.* Faulty key switch A457	*a.* Replace switch.
		b. Faulty AM-CW switch	*b.* Replace switch.
		c. Faulty circuit component	*c.* Make voltage and resistance checks of Q3 on Modulator Assembly A4A2 (para 7-8).

Item No.	Symptom	Probable trouble	Corrective action
14	No external key transmission. Internal key OK.	*a.* Faulty connector A4J3	*a.* Replace connector.
		b. Broken conductor	*b.* Make continuity test of wiring harness.
		c. Defective external key	*c.* Replace external key.
15	No am transmission; Cw OK	*a.* Faulty modulator component	*a.* Make voltage and resistance measurements on modulator assembly A4A2 (para 7–8).
		b. Broken conductor	*b.* Make continuity test of wiring harness (fig. 7–28).
		c. Defective microphone	*c.* Replace microphone.
		d. Shorted AM–CW switch	*d.* Replace AM–CW switch.
16	Transmitter weak on all channels.	*a.* Faulty transmitter or modulator component	*a.* Make voltage and resistance measurements on transmitter and modulator (paras 7–7 and 7–8).
		b. Faulty LOADING control	*b.* Replace Loading control.
		c. Broken antenna wire or incorrect length of wire.	*c.* Replace antenna wire. Erect to correct length.
		d. Misaligned A4A21228	*d.* Align transmitter (para 7–14).
17	Transmitter weak on one channel.	*a.* Misaligned driver or power output coil.	*a.* Align transmitter (para 7–14).
		b. Inactive crystal, or wrong frequency for weak channel.	*b.* Replace crystal.
		c. Defective driver or power output coil.	*c.* Replace defective coil.
18	ANT. INDICATOR does not illuminate. Transmitter OK.	*a.* Defective lamp or socket	*a.* Replace deefective component.
		b. Defective component on A4A1 Matching Network Assembly (Main Chassis Networks).	*b.* Replace defective component.
		c. Defective IND. SENS switch	*c.* Replace switch.
		d. Defective AM–CW switch	*d.* Replace AM–CW switch.
19	No keying sidetone or weak sidetone.	Defective A4A2Q3 or associated component.	Make voltage and resistance measurements on A4A2Q3 (para 7–8).
		BATTERY TEST TROUBLES	
20	BAT. TEST lamp does not illuminate with good battery when BAT. TEST switch is depressed.	*a.* Defective lamp	*a.* Replace lamp.
		b. Faulty BAT. TEST switch	*b.* Replace switch.
		c. Broken conductors	*c.* Make continuity test of wiring harness (fig. 7–28).
		d. Faulty A4A2Q4 or associated component.	*d.* Make voltage and resistance measurements on A4A2Q4 (para 7–8).

7–5. Voltage and Resistance Measurements

a. General. Voltage and resistance measurements are provided for the receiver assembly, transmitter assembly, and main chassis networks. Measurements are given for the three transistor elements with respect to ground. In all charts the symbols applying to transistors are: E, emitter; B, base, and C, collector.

b. Dc Voltage Measurements. All dc voltage measurements are made with the negative side of Multimeter TS–352/U connected to ground of the printed circuit board. Positive connection is made to the printed circuit side (hereinafter referred to as the "pad" side) of the board, at the indicated circuit points. Supporting illustrations show the location of each transistor, with the elements identified. Starting with the highest voltage scale on the TS–352/U and working down to the lowest voltage scale practicable, use the DIRECT setting of the FUNCTION switch. All voltages are positive. Most accurate results will be obtained if external power is used in place of the battery. Power supplies should be set for 4.0 volts for receiver voltage measurements, and 12.0 and 28.0 volts for transmitter and modulator assemblies, respectively. Test cable No. 1 (figure 7–1) provides the most convenient method of applying power from external power supplies. Voltage readings within 10 percent of those shown in the charts should be considered normal.

c. Resistance Measurements. Resistance values are given for both ground negative and ground positive connections of the multimeter. Measure-

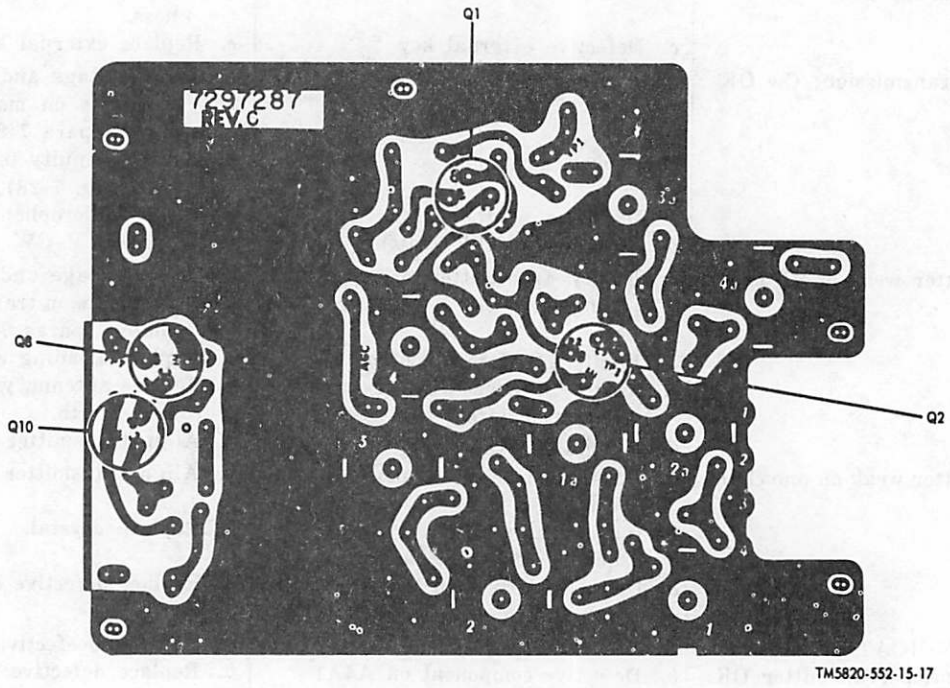


Figure 7-2. Voltage and resistance test points, receiver assembly A4A7A2 (upper board).

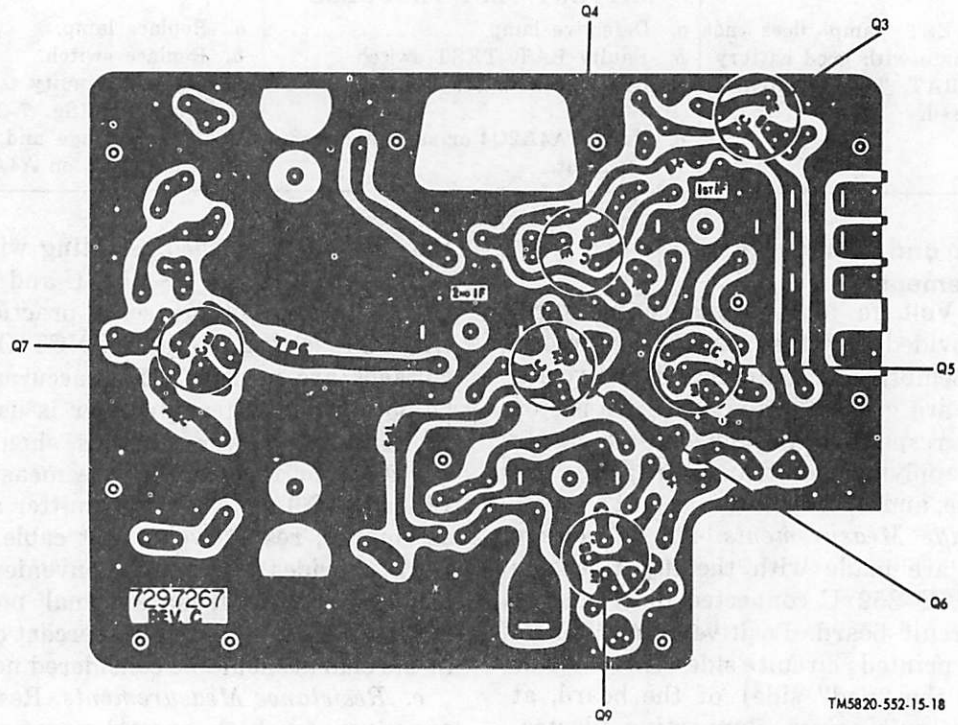


Figure 7-3. Voltage and resistance test points, receiver assembly A4A7A1A1 (lower board).

ments within 20 percent of those shown on the charts should be considered normal. Use the position of the multimeter RANGE SWITCH which will provide as near center-of-scale indication of the meter as possible for finite resistance measurements. For continuity measurements, always use a range higher than X1 to avoid excessive currents. Resistance measurements are made *without* power connected to the AN/PRC-64A and with the battery removed.

d. Removal of Components. Voltage and resistance measurements require removal of transmitter and receiver assemblies (paras 2-5*b* and 7-10). When removed, assemblies may be electrically reconnected to the top plate assembly by using the chassis extension adapter cable shown in figure 7-1.

7-6. Receiver Voltage and Resistance Measurements

(figs. 7-2 and 7-3)

NOTE

For convenience in measuring, remove receiver assembly from top plate assembly and reconnect using chassis extension adapter (fig. 7-1).

Symbol	Stage	Dc Volts ±10% (note 1)			Ohms ±20% (notes 2 and 3)		
		E	B	C	E	B	C
Q-1	1st RF	3.1	2.8	0	660	22	.5
					70	3700	.5
Q-2	2d RF	3.1	2.8	0.18	1100	300	240
					1100	3700	220
Q-3	Local Osc.	3.7	3.6	0	1000	28	10
					800	4200	10
Q-4	Mixer	3.4	3.2	0	1500	21	2.5
					70	4200	2.5
Q-5	1st IF	3.3	3.1	1.0	1300	1200	2100
					1300	4200	1400
Q-6	2d IF	3.6	3.3	0	1300	25	4.0
					1100	4300	4.0
Q-9	BFO (BFO control on)	2.9	3.1	0	1400	16	1.5
					340	4100	1.5
	(BFO control off).	2.0	3.1	0	600	16	1.5
					280	3600	1.5
Q-8	1st Audio	0.22	0.80	1.4	1000	3600	2700
					1000	2200	2000
Q-10	2d Audio	0.85	1.4	3.3	160	2700	500
					180	2000	500
Q-7	AGC Amp. (BFO control on).	2.9	0	3.1	33	1.4	31
					2000	1.4	1800
	(BFO control off).	.06	0	3.1	25	1.4	31
					32	1.4	1400

NOTES

1. Voltage measurements are made with power applied and GAIN CONTROL turned fully clockwise to maximum, using 20,000 ohms per volt meter such as TS-352/U. All voltages are measured with positive lead to circuit point and negative lead to ground.
2. Resistance is measured with meter which employs battery voltage no greater than 22.5 VDC, such as TS-352/U.
3. Upper values are measured with positive meter lead connected to ground and negative lead connected to indicated circuit point. Lower values are measured with negative lead to ground and positive lead connected to indicated circuit point.

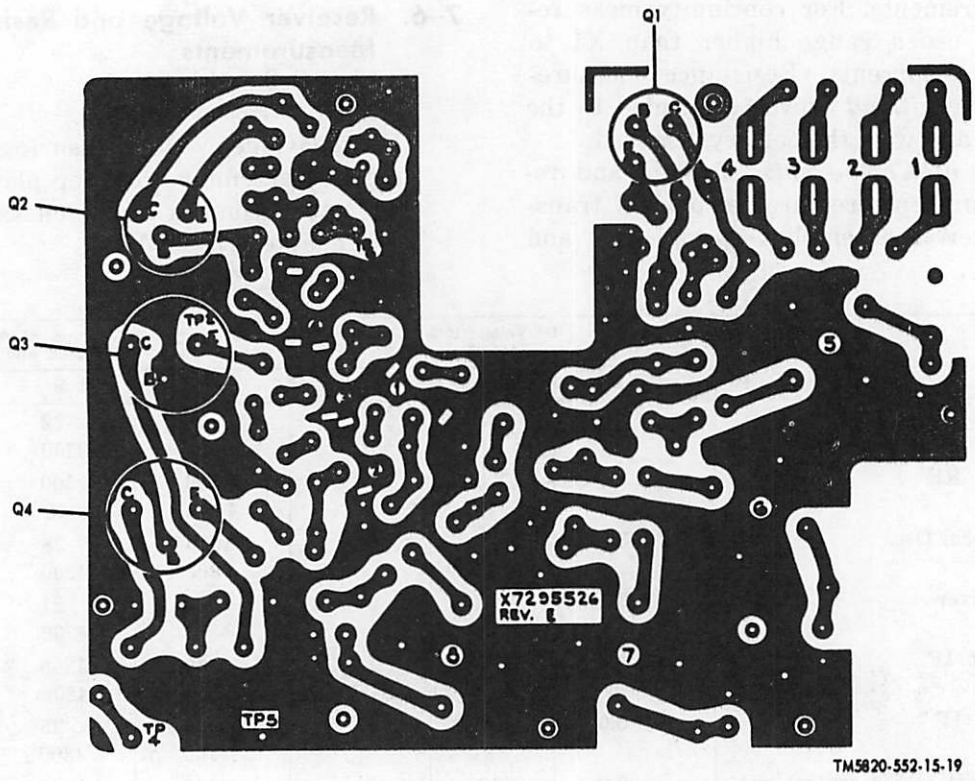


Figure 7-4. Voltage and resistance test points, transmitter assembly, A4A9A2.

7-7. Transmitter Voltage and Resistance Measurements
(fig. 7-4)

Symbol	Stage	DC Volts ±10% (note 1) E	B	C	Ohms ±20% (notes 2 and 3) E	B	C	E
(AM-CW switch in CW position. Internal key held down for voltage measurements)								
Q-1	RF Osc.	2.1	0.7	22	100	2400	3700	4.0
					100	200	30K	
Q-2	RF Driver	4.2	0	26	22	11	21	2.0
					60	11	∞	
Q-3	RF Power Amp.	0.25	0	28	1	0	11	3.5
					1	0	∞	
Q-4	RF Power Amp.	0.25	0	28	1	0	10	3.5
					1	0	∞	
(AM-CW switch in AM position. Internal key up)								
Q-1	RF Osc.	2.2	0.8	23	----------			4.0
Q-2	RF Driver	3.4	0	12	----------			1.0
Q-3	RF Power Amp.	0.1	0	28	----------			2.0
Q-4	RF Power Amp.	0.1	0	28	----------			2.0

NOTES

1. Voltages are measured with 20,000 ohms per volt meter, such as TS–352/U, and power is applied to AN/PRC–64A. All voltages are measured with positive lead to circuit point and negative lead to ground.
2. Resistance is measured with transmitter removed from top plate assembly using a meter which employs battery voltage no greater than 22.5 VDC, such as TS–352/U.
3. Upper values are measured with positive meter lead connected to ground and negative lead connected to indicated circuit point. Lower values are measured with negative lead connected to ground and positive lead connected to indicated circuit point.

7–8. Modulator and Battery Test Voltage and Resistance Measurements

(fig. 7–5)

NOTE

WHISPER switch in IN position AM–CW switch in AM position REC–SEND switch in REC position

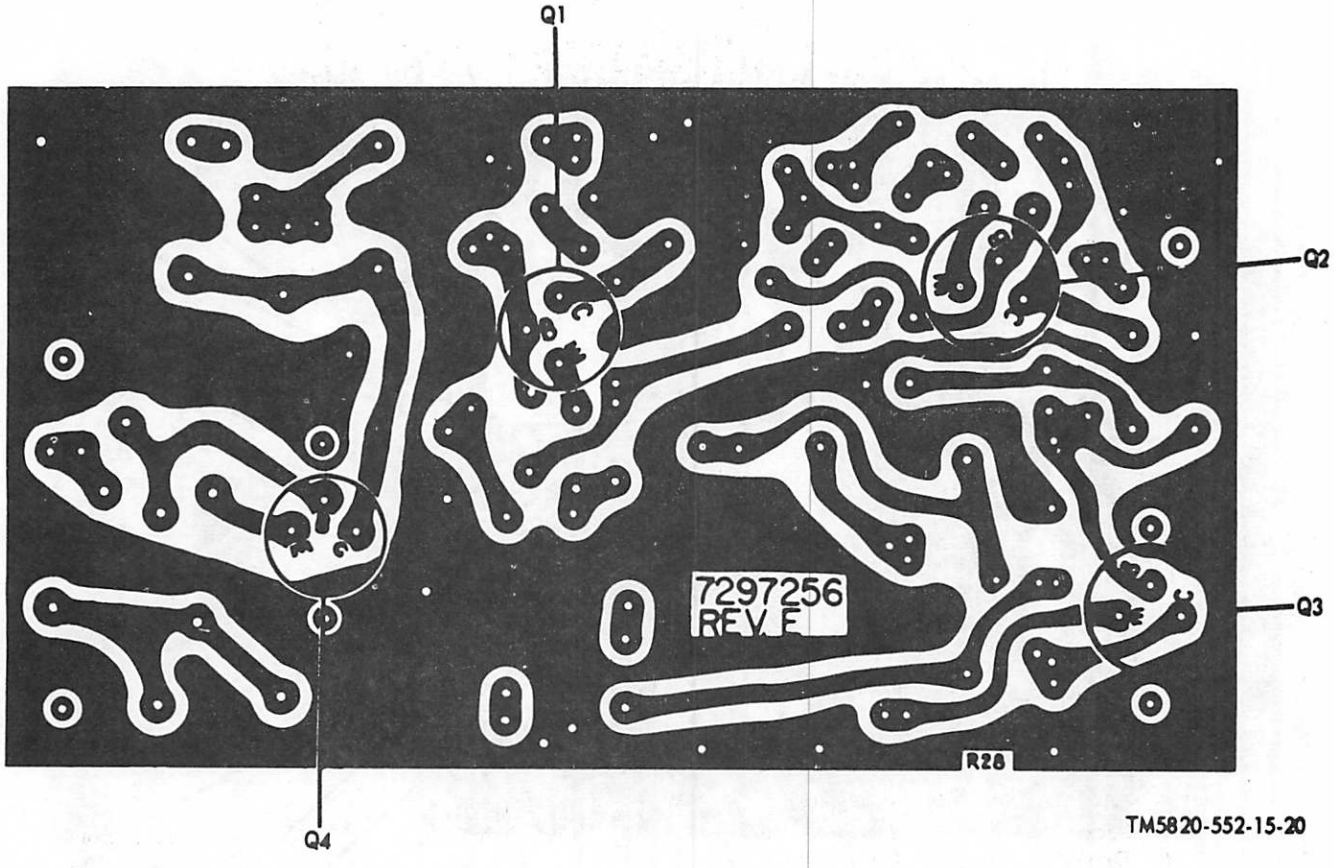


Figure 7–5. Voltage and resistance test points, modulator and battery test assembly A4A2.

Symbol	Stage	DC Volts ±10% (note 2)			Ohms ±20% (notes 3 and 4)		
		E	B	C	E	B	C
Q-4	Bat. Test	18.5	18.0	18.3	140	11	150
(note 1)					80	1100	130
Q-1	1st Audio	8.4	8.0	3.5	3400	2200	2700
					2200	10K	2100
Q-2	2d Audio	10.0	9.0	2.4	3700	1850	1850
					2000	30K	1600
Q-3	Mod. Keyer	27.1	26.9	13.0	28	30	20
					30K	30K	30K

NOTES

1. Depress and hold BAT. TEST switch when making measurements on Q-4.
2. Voltage measurements are made with power applied, using 20,000 ohms per volt meter such as TS-352/U. All voltages are measured with positive lead to circuit point and negative lead to ground.
3. Resistance is measured with meter which employs battery voltage no greater than 22.5 VDC, such as TS-352/U.
4. Upper values are measured with positive meter lead connected to ground and negative lead connected to indicated circuit point. Lower values are measured with negative meter lead connected to ground and positive lead connected to indicated circuit point.

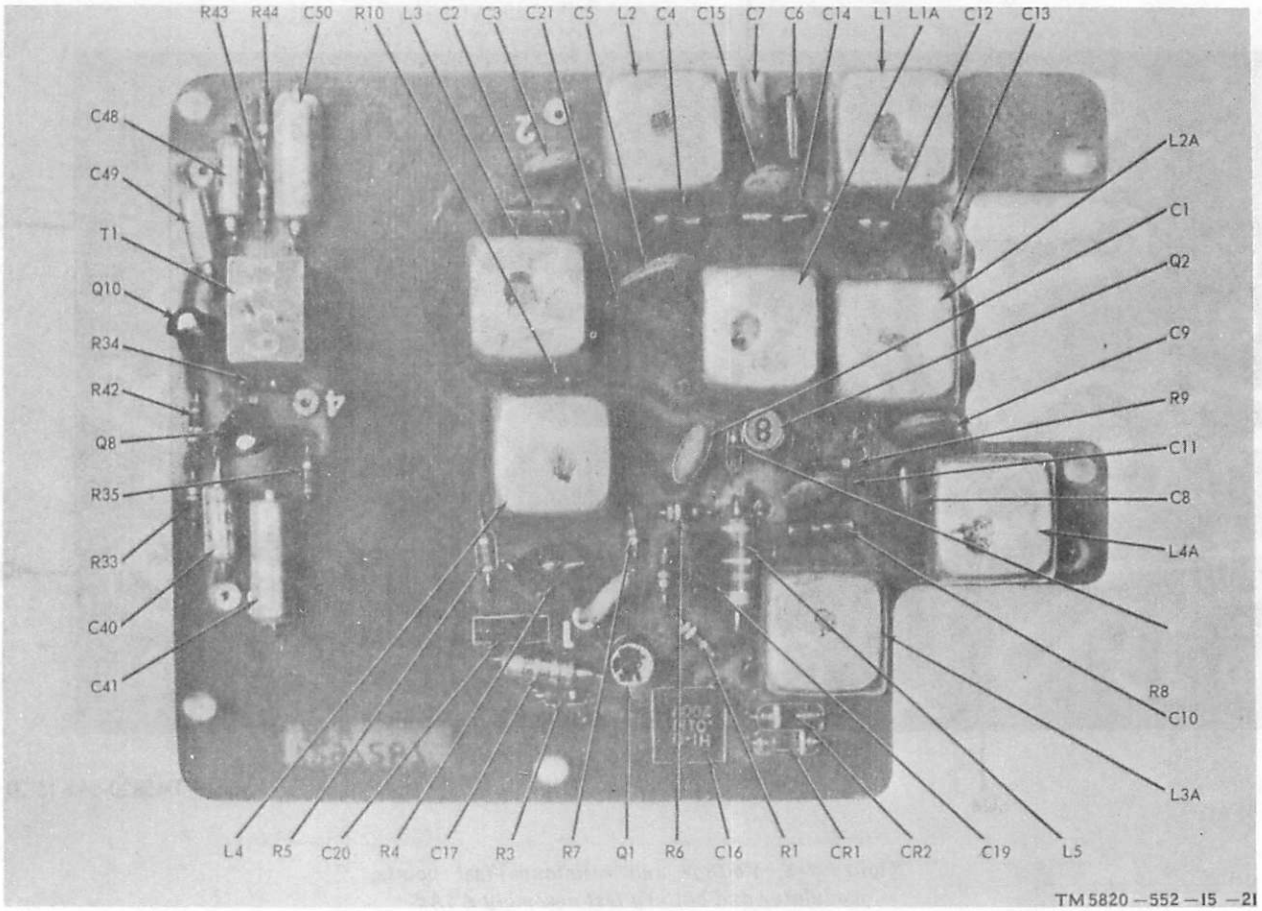


Figure 7-6. Parts locations, receiver assembly A4A7A2 (upper board).

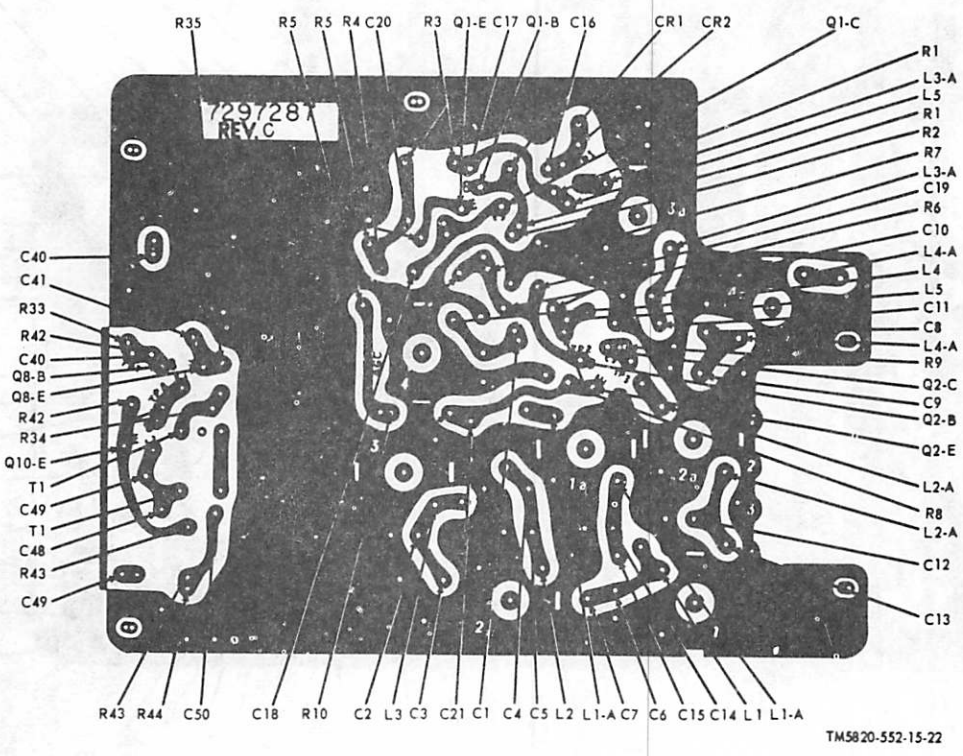


Figure 7–7. Component terminal locations, receiver assembly A4A7A2 (upper board).

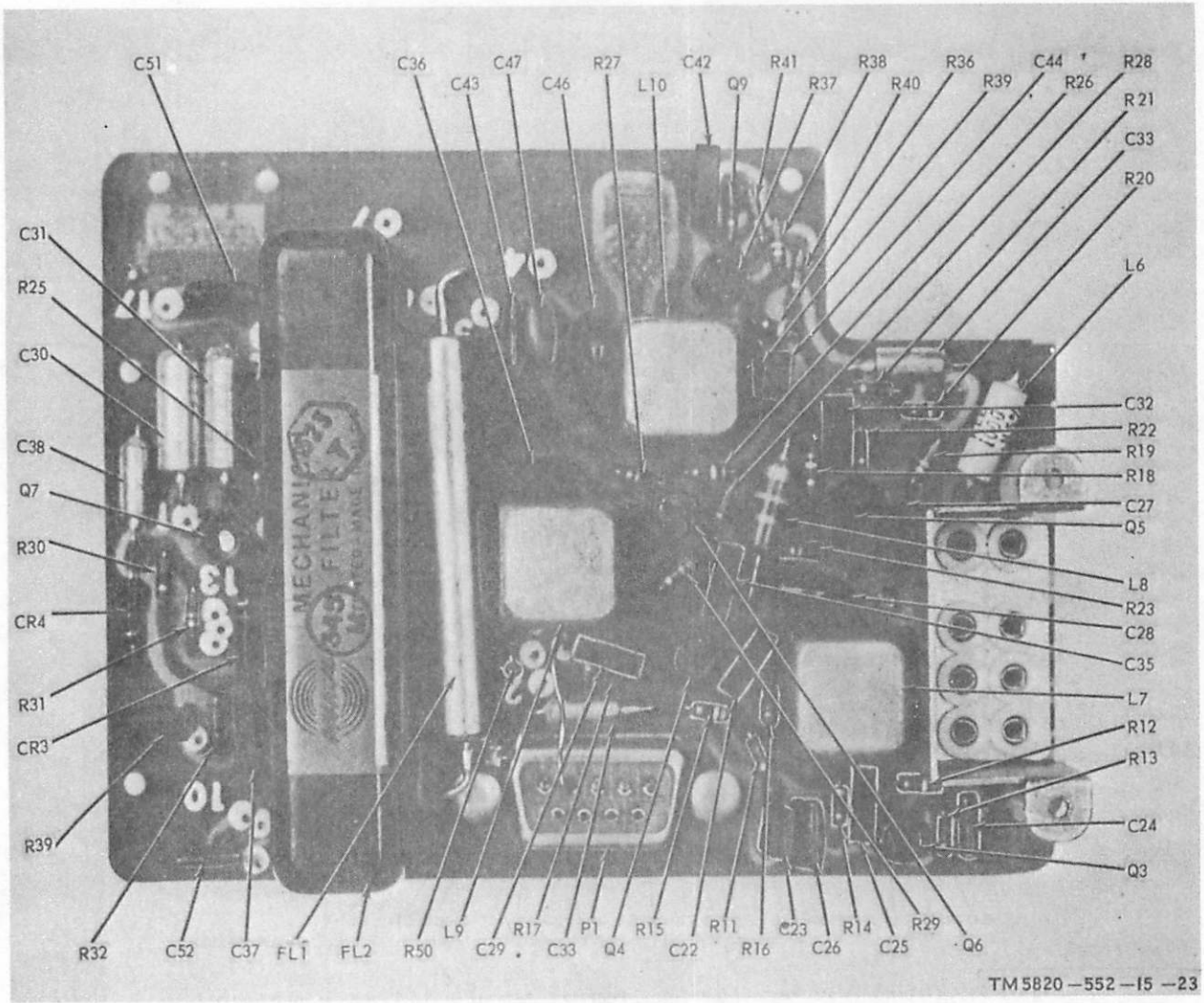


Figure 7-8. Parts locations, receiver assembly A4A7A1A1 (lower board).

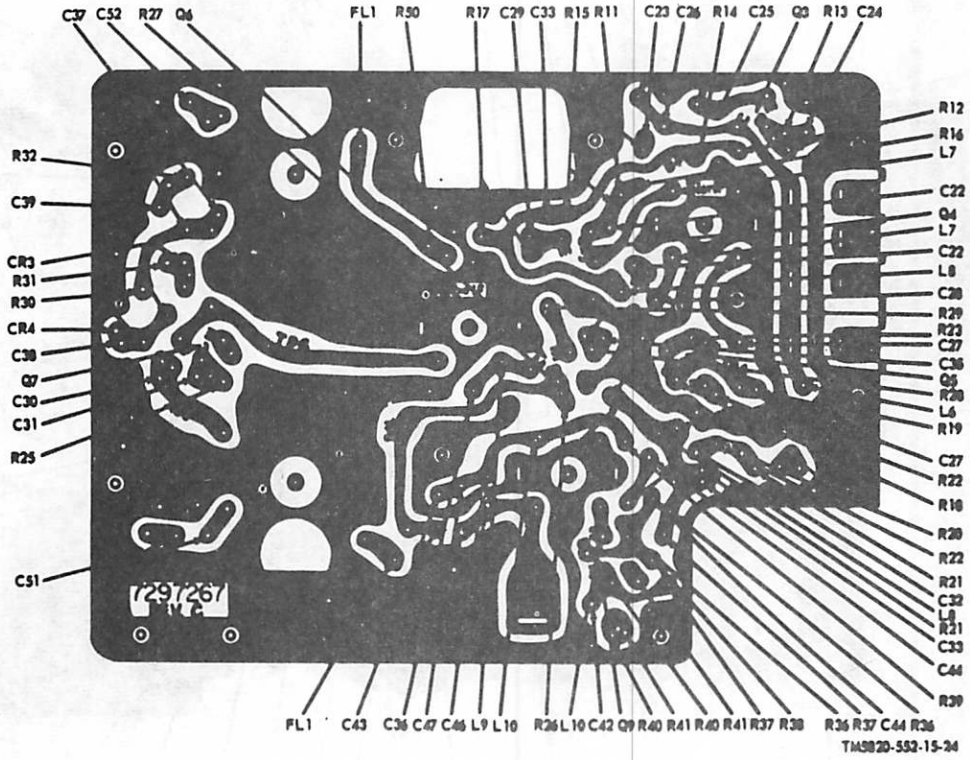


Figure 7-9. Component terminal locations, receiver assembly A4A7A1A1 (lower board).

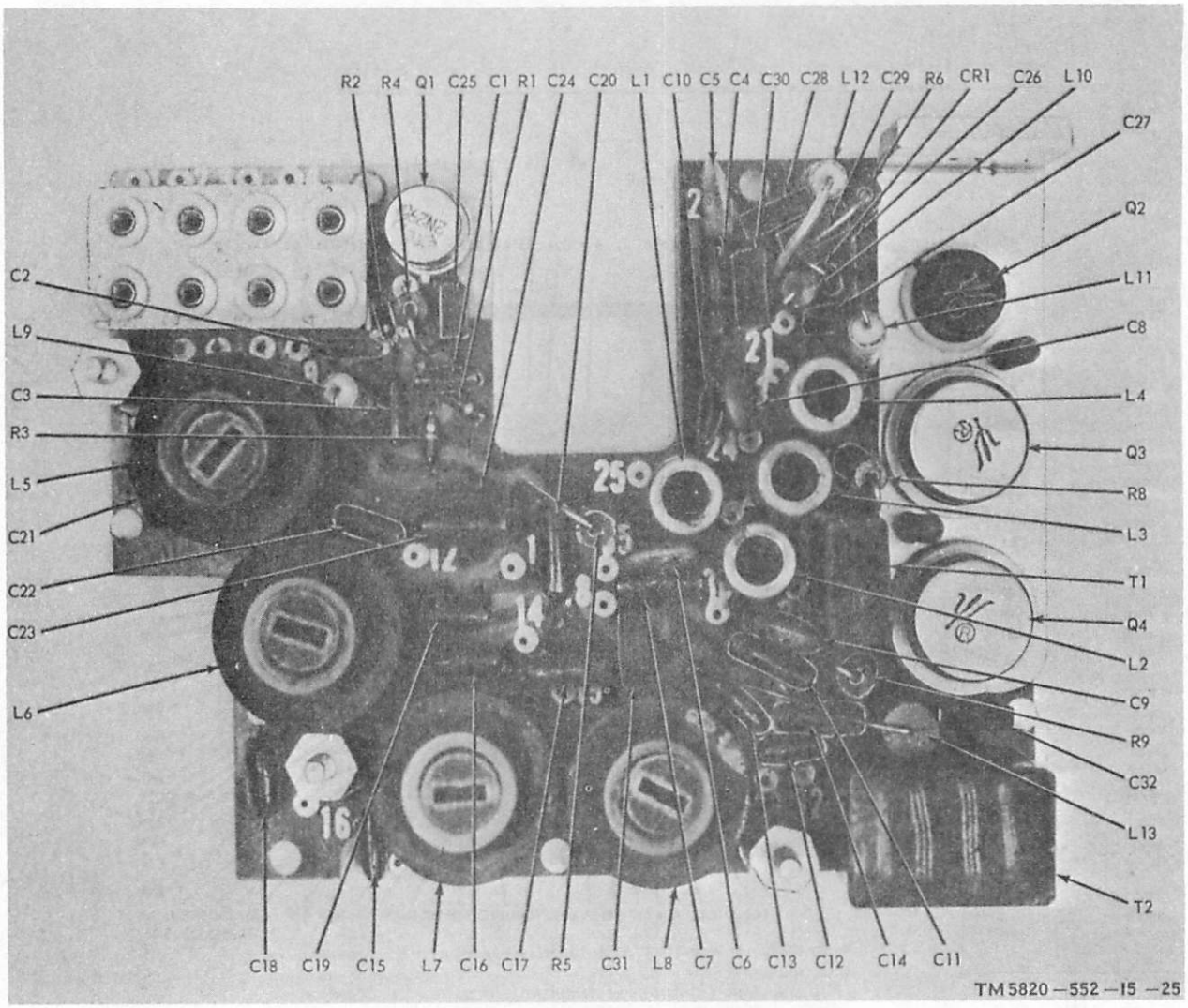


Figure 7–10. Parts locations, transmitter assembly A4A9A2.

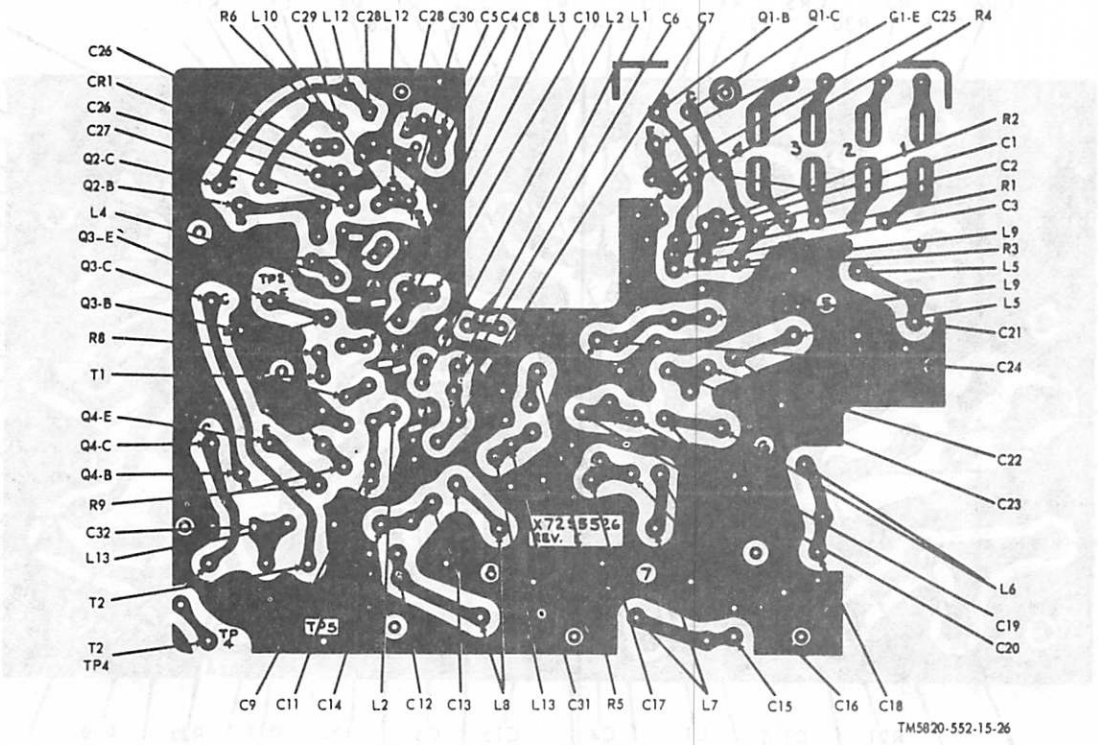


Figure 7–11. Component terminal locations, transmitter assembly A4A9A2.

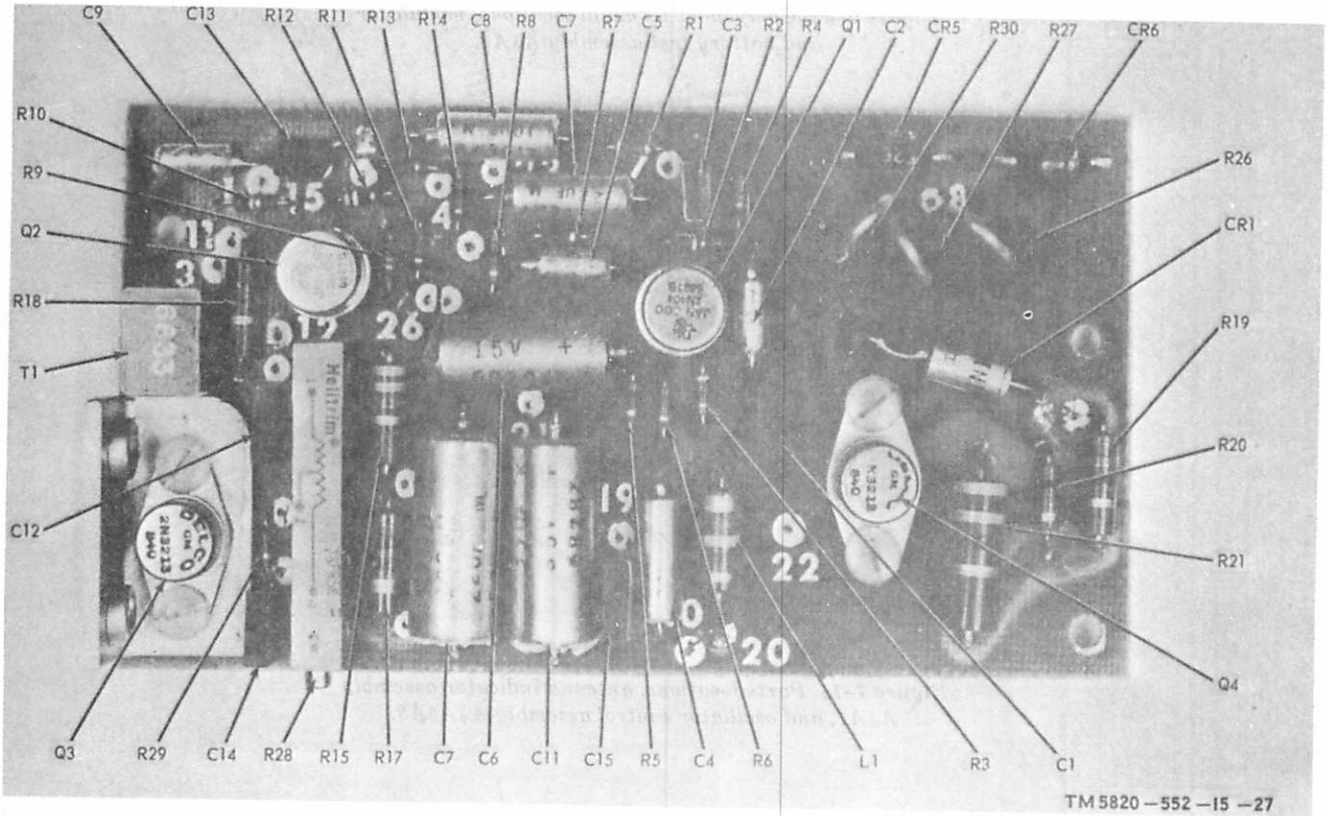


Figure 7–12. Parts locations, modulator and battery test assembly A4A2.

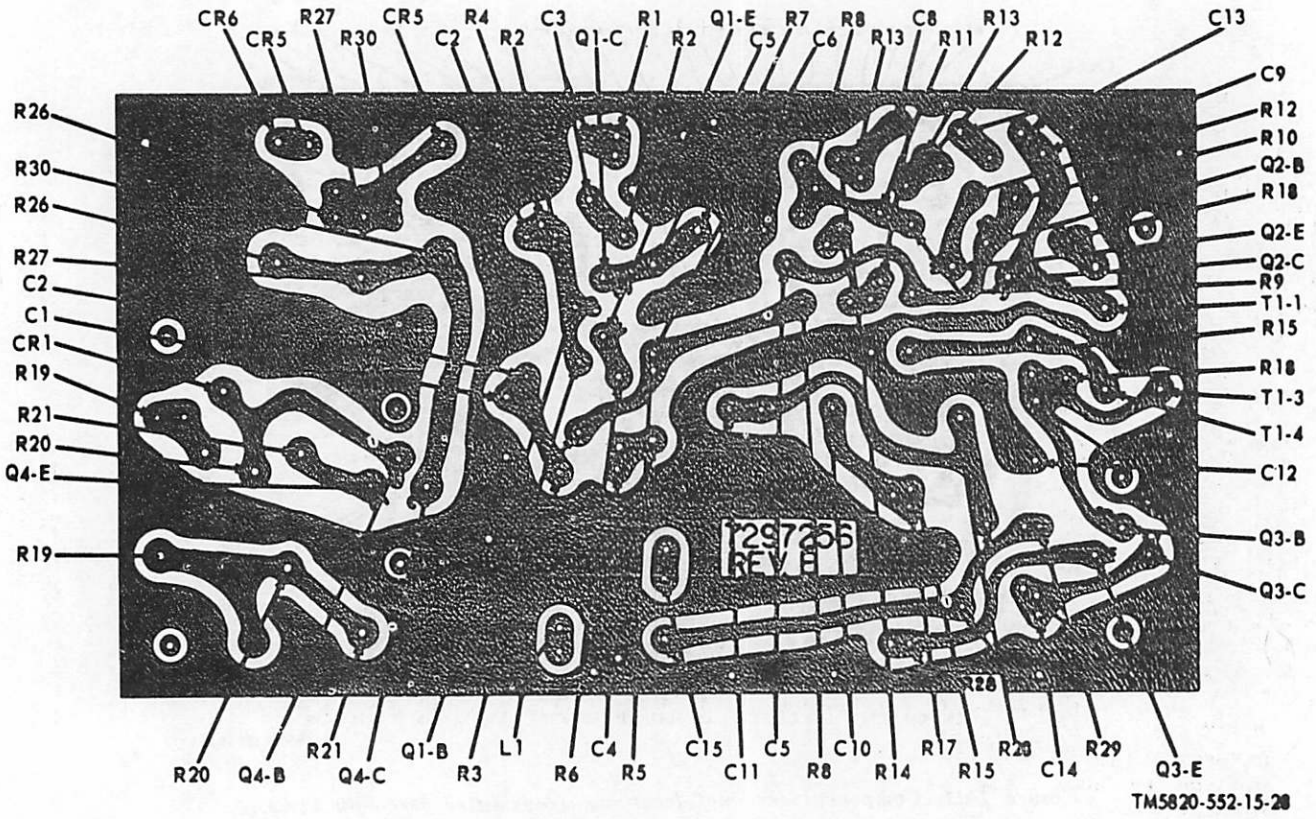


Figure 7–13. Component terminal locations, modulator and battery test assembly A4A2.

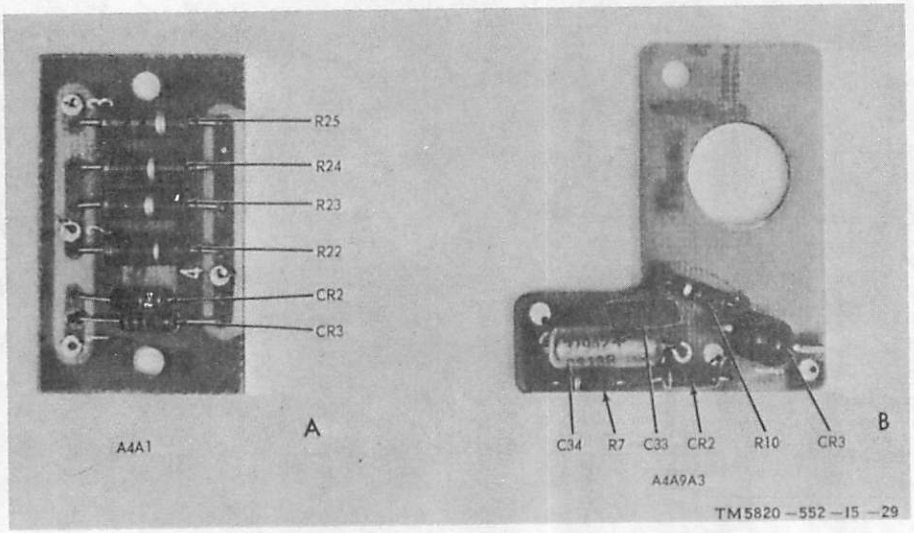


Figure 7–14. Parts locations, antenna indicator assembly A4A1, and oscillator control assembly A4A9A3.

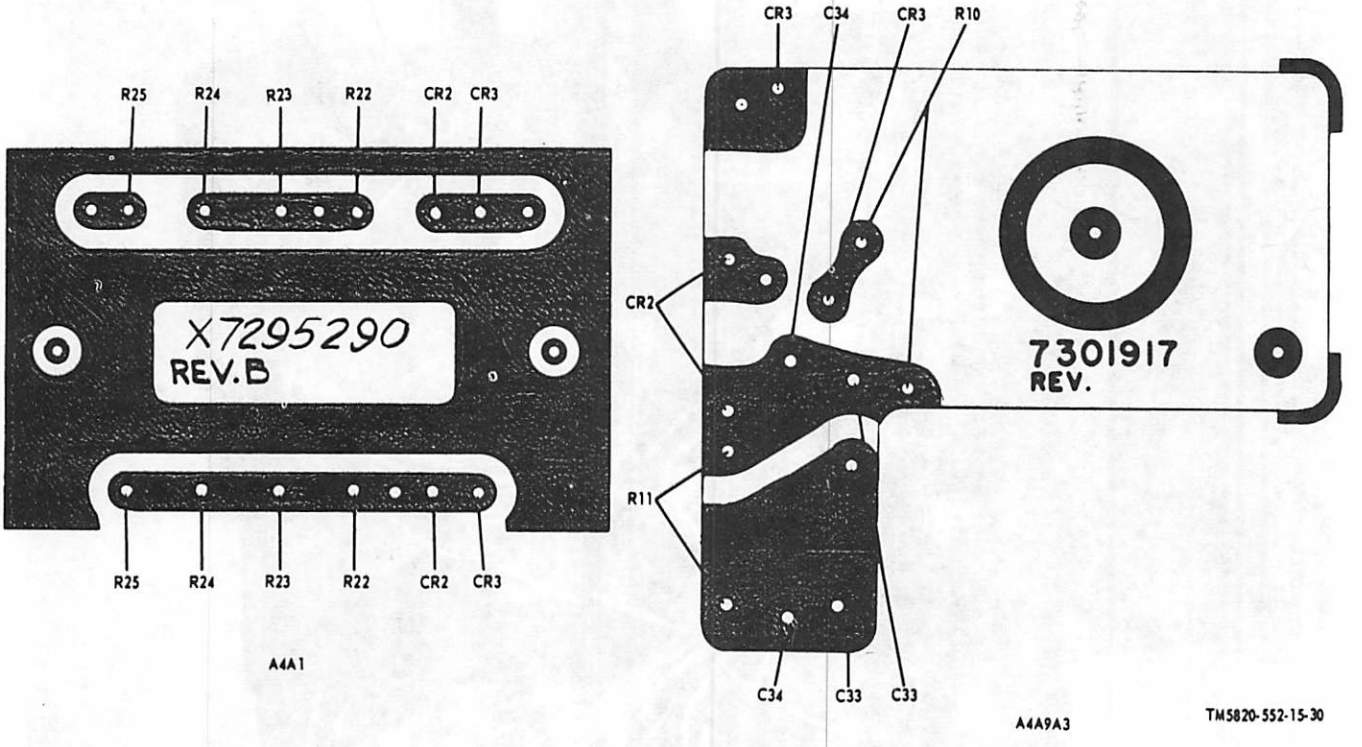


Figure 7-15. Component terminal locations, antenna indicator assembly A4A1, and oscillator control assembly A4A9A3.

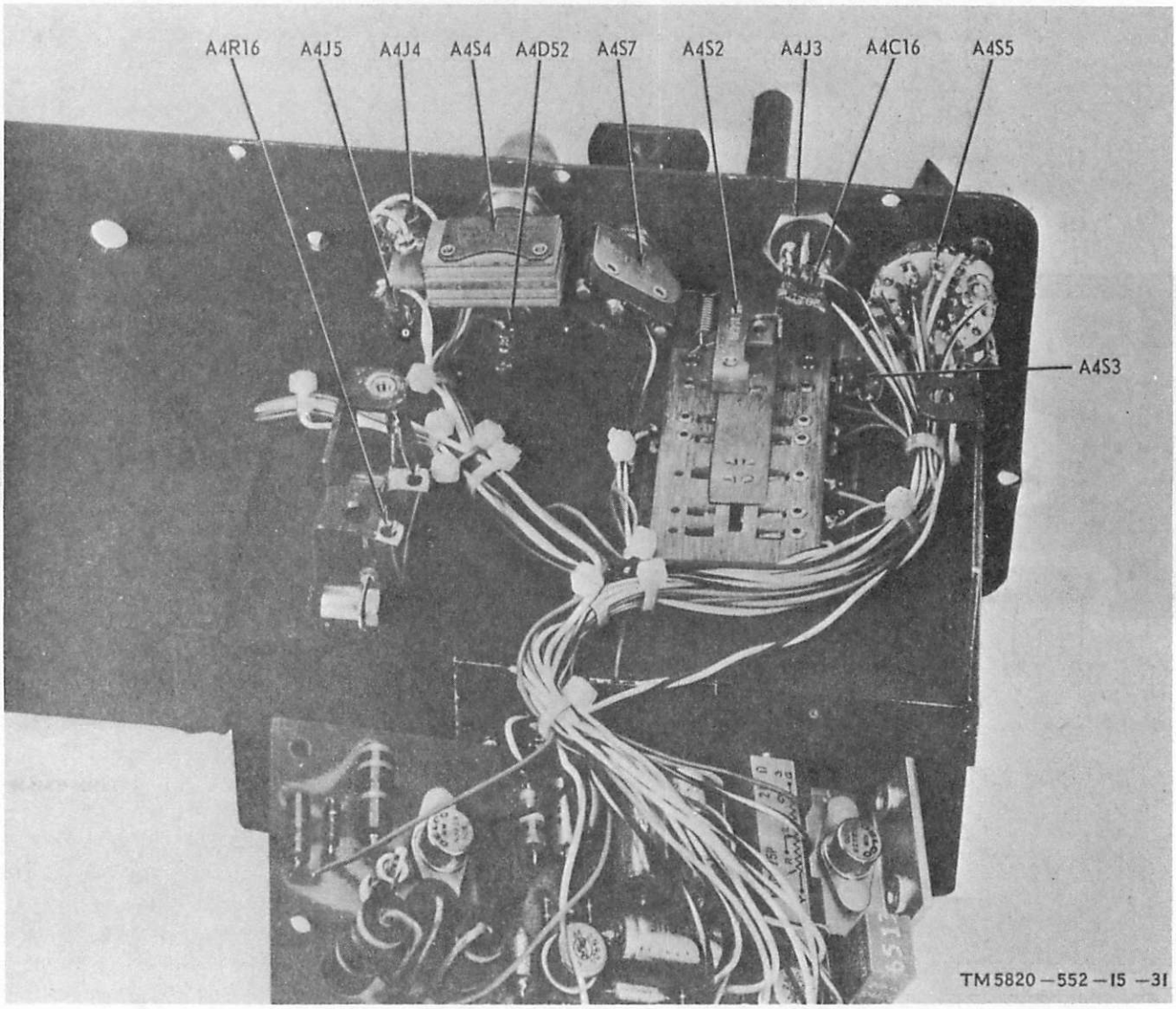


Figure 7–16. Parts locations, top plate assembly A4, transmitter side.

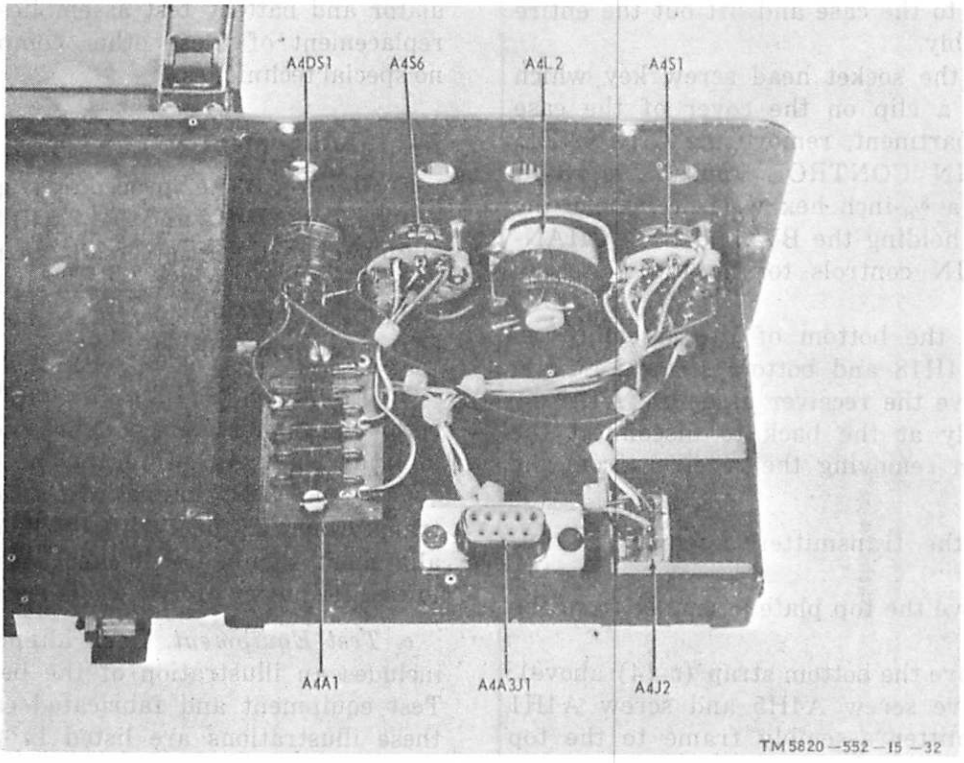


Figure 7–17. Parts locations, top plate assembly A4, receiver side.

Section III. REMOVAL, REPLACEMENT, ALIGNMENT AND REPAIR

7–9. General Parts Replacement Techniques

The AN/PRC–64A is a transistorized unit, constructed compactly. When replacing parts and assemblies be careful to observe the precautions in this section.

a. Whenever wires are removed, replace with the same lead dress and length as the wires which were removed. Always examine replaced wires to be sure insulation is in good condition so that accidental grounding of the conductor will not occur.

b. Use a pencil-type soldering iron with a 25-watt maximum capacity. This equipment is transistorized. If only ac-operated irons are available, use an isolating transformer. Do not use a soldering gun; damaging voltages can be induced in components. Do not allow drops of solder to fall into set.

c. Check any soldering iron, before use, for shorts to the tip. If a short is found, do not use the iron on this equipment.

d. When soldering or unsoldering transistor or diode leads, work quickly; wherever wiring permits, use a heat sink (such as a long-nosed pliers) between the soldered joint and the transistor or diode.

e. To remove solder from printed circuit board pads and connectors, use a piece of *untinned* copper braid, approximately ⅛ inch in diameter. Shielding from coaxial cable (RG–59/U) may be used for this purpose. Dip the end of the shield in solder flux. Heat the soldered pad or connector until the solder begins to flow. Touch the fluxed end of the braid to the heated pad or connector, and solder will flow up into the braid, leaving the pad or connector relatively free of solder. Parts or wires can then be easily removed.

7–10. Removal of Components (figs. 7–18 and 7–19)

a. Remove the top plate assembly from the case by removing ten screws (fig. 2–2).

b. Remove battery from battery compartment.

c. Remove the receiver assembly A4A7 from the top plate assembly A4 as follows:

(1) Remove ten screws which hold the top

plate assembly to the case and lift out the entire top plate assembly.

(2) With the socket head screw key which is attached to a clip on the cover of the case accessory compartment, remove the CHANNEL, BFO and GAIN CONTROL knobs. (fig. 3-1)

(3) With a 3/8-inch hex wrench remove the retaining nuts holding the BW and BFO CHANNEL and GAIN controls to the top plate assembly.

(4) From the bottom of the assembly remove screw A4H18 and bottom strap A4MP18.

(5) Remove the receiver assembly A4A7 by lifting carefully at the back to disconnect the connector, then removing the receiver from the top plate.

d. Remove the transmitter assembly as follows:

(1) Remove the top plate assembly from the case (*a* above).

(2) Remove the bottom strap (*c* (4) above).

(3) Remove screw A4H5 and screw A4H1 holding transmitter assembly frame to the top plate assembly.

(4) Using the hex key wrench remove the transmitter CHANNEL switch knob.

(5) With a 3/8-inch hex wrench remove the CHANNEL switch retaining nut.

(6) Carefully lift the transmitter assembly at its connector location to disconnect the transmitter from the top plate assembly. Remove the transmitter.

e. Remove the modulator and battery test printed circuit board as follows:

(1) Remove the top plate assembly from the case (*a* above).

(2) Remove the three screws A4H5 holding the circuit board of modulator and battery test assembly to the brackets on the frame. Insulating sheet A4E1 can also be removed at this time. A fourth screw A4H5 holding a second insulating sheet A4E1 to end frame is also removed, and the sheet put aside. Leave the fifth screw A4H5 attached for pivoting the circuit board.

(3) Carefully lift the modulator and battery test assembly A4A2 and fold it back for service.

NOTE

The modulator and battery test assembly A4A2 is wired to the top plate assembly, and cannot be completely removed except by unsoldering the conductors attached to the circuit board.

f. All other components are readily accessible by removal of the receiver, transmitter, and modulator and battery test assemblies. Removal and replacement of these other components require no special techniques.

7-11. Alignment

a. General. The procedures given in paragraphs 7-12, 7-13, and 7-14 will provide precise alignment of the receiver and transmitter. These procedures, rather than those given in chapter 2, should be used whenever time and the availability of test equipment permit.

b. Alignment Frequencies. RF alignment of both transmitter and receiver should be done on all four channels, preferably at the center frequency of each channel. However, if coils or transformers in tuned circuits have been replaced, alignment should be checked at the highest and lowest frequency of the affected channel.

c. Test Equipment. Each alignment procedure includes an illustration of the bench test setup. Test equipment and fabricated cables shown in these illustrations are listed in paragraph 7-2.

d. Removal of Components. RF alignment of both receiver and transmitter can be accomplished by removing the top plate assembly from the case (para 7-10*a*). Receiver IF alignment requires removal of the receiver assembly from the top plate assembly (para 7-10*b*).

7-12. Receiver RF Alignment

a. Install receiver crystals in each of the four channel positions (fig. 2-4). Most accurate alignment will result if crystals representing the center frequency of each channel are installed.

b. Connect test equipment as shown in figure 7-20.

NOTE

Radio Set AN/PRC-64A headset cord with subminiature phone plug may be used in the absence of test cable No. 3 with attaching subminiature phone plug (fig. 7-1). Unplug headset cord at earphone. Attach two pins from 7- or 9-pin miniature tube socket to connector pins of headset cord and secure at terminals on TS-585/U. Use of this bench-fabricated cable may even be preferable to using the RG-188A/U cable with alligator clips. Clips are large and unwieldy for placement at the terminals, and may make contact, thus causing a short. Pins from tube socket are small and insure that shorting out will not

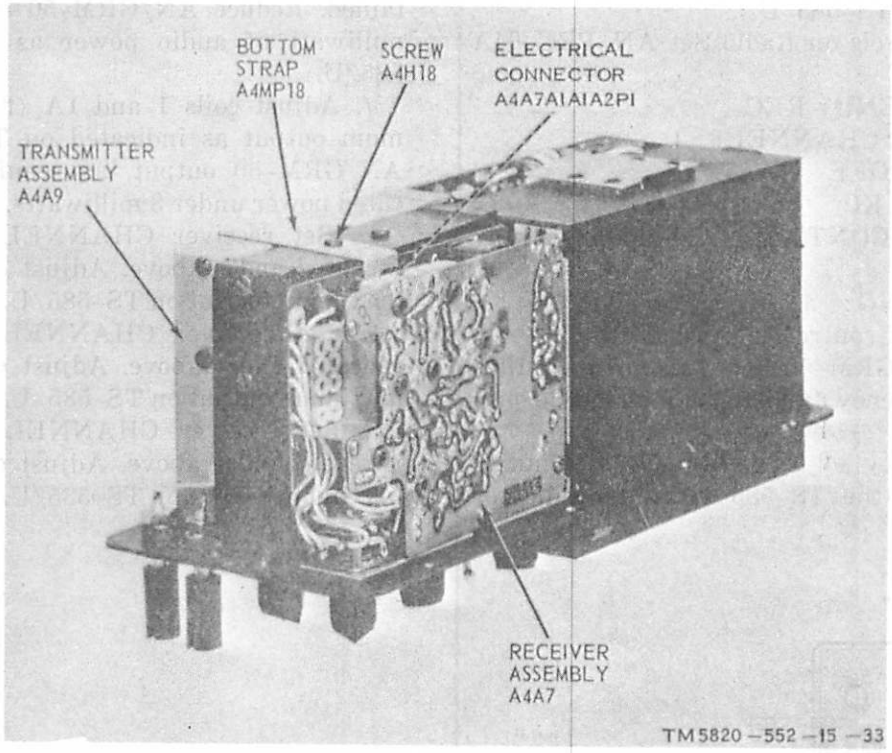


Figure 7-18. Hardware locations, receiver side.

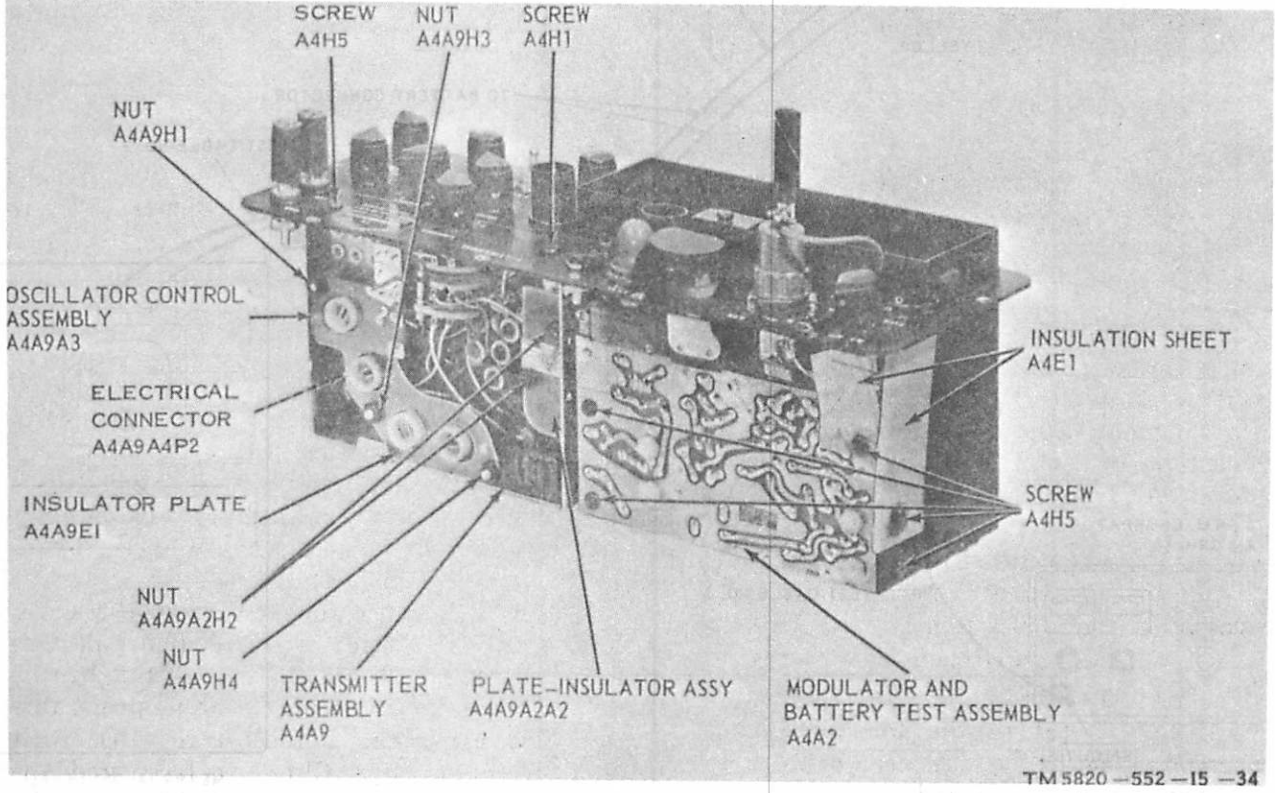


Figure 7-19. Hardware locations, transmitter side.

occur when attachment is made at the terminals of TS-585/U.

c. Set the controls on Radio Set AN/PRC-64A as follows:

(1) REC-SEND: REC
(2) Receiver CHANNEL: 1
(3) BFO: OFF
(4) BW: 6 KC
(5) GAIN CONTROL: Maximum (fully clockwise)
(6) LOADING: 1
(7) All other controls: Any position.

d. Adjust AN/GRM-50 for approximately 1000 microvolts, frequency 1000 Hz modulated 30 percent.

e. Set frequency of AN/GRM-50 to channel frequency, using the TS-585/U as an indicator of frequency at which maximum output is obtained. Reduce AN/GRM-50 output to obtain 1 milliwatt of audio power as indicated on TS-585/U.

f. Adjust coils 1 and 1A (fig. 2-4) for maximum output as indicated on TS-585/U. Reduce AN/GRM-50 output, as required to keep indicated power under 3 milliwatts.

g. Set receiver CHANNEL switch to 2 and repeat *d* and *e* above. Adjust coils 2 and 2A for maximum output on TS-585/U.

h. Set receiver CHANNEL switch to 3 and repeat *d* and *e* above. Adjust coils 3 and 3A for maximum output on TS-585/U.

i. Set receiver CHANNEL switch to 4 and repeat *d* and *e* above. Adjust coils 4 and 4A for maximum output on TS-585/U.

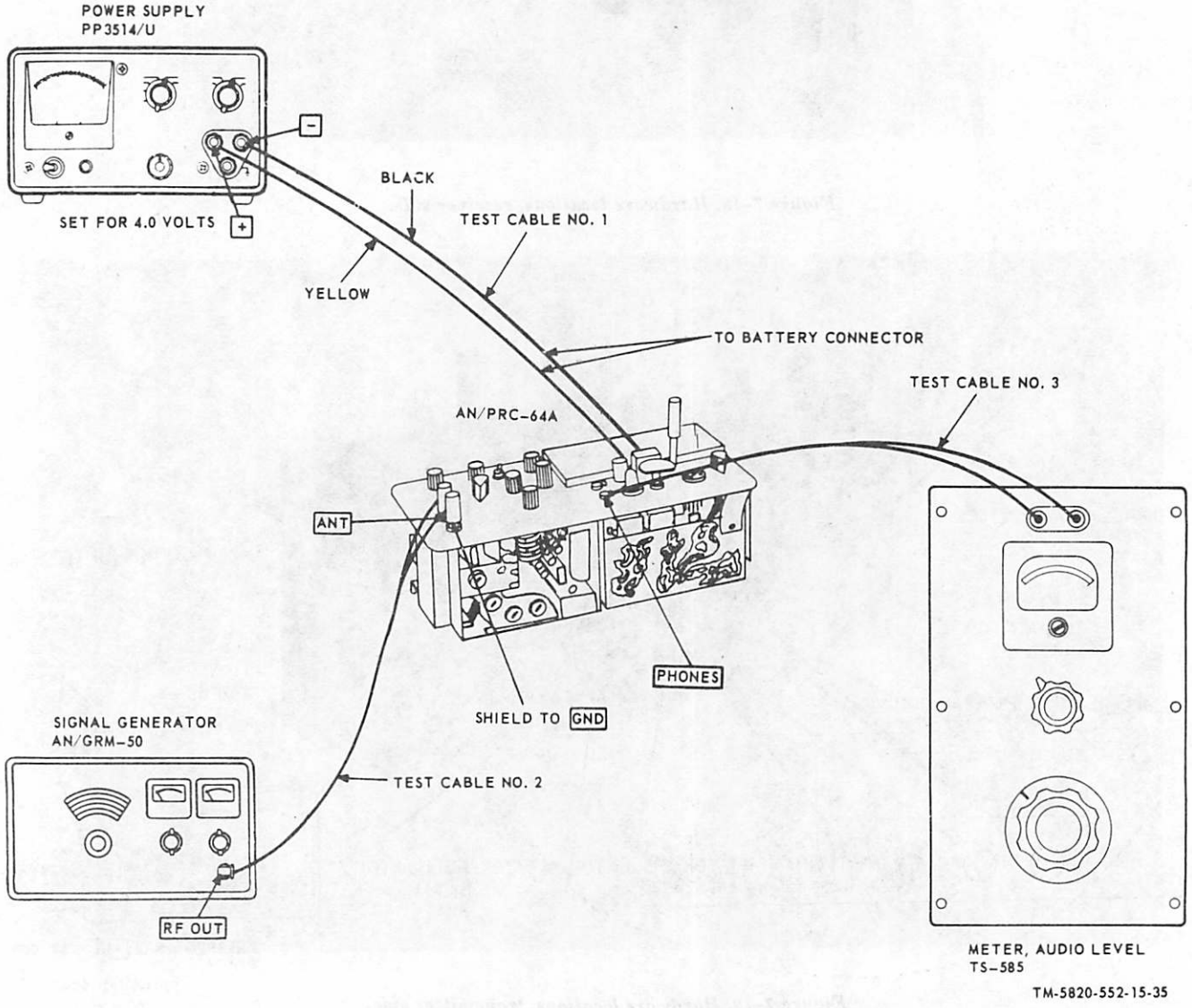


Figure 7-20. Receiver RF alignment, test setup.

7–13. Receiver IF and BFO Alignment

a. Construct the chassis extension cable and test cables as shown in figure 7–21. See figure 7–1 for construction details.

b. Remove the receiver assembly (para 7–10).

c. Remove the battery from the AN/PRC–64A and connect the test equipment as shown in figure 7–21.

d. Set the voltage of the PP–3514/U for 4.0 VDC.

e. Set the AN/PRC–64A controls as follows:
(1) RECEIVER CHANNEL: Any
(2) BFO: OFF
(3) BW: 0.5 KC
(4) GAIN CONTROL: Max. clockwise
(5) REC–SEND: REC
(6) LOADING: 1
(7) IND SENS: OFF
(8) All other controls: Any position.

f. Set up the AN/GRM–50, monitored by the AN/USM–207, to produce a signal of 455.00 kHz.

g. Adjust signal level of AN/GRM–50 to produce a voltage of approximately 50 millivolts on the ME–30A/U.

h. Using the alignment tool in the AN/PRC–64A case, align 1st IF (L7) and 2d IF (L9) for maximum reading on ME–30A/U. Repeat the adjustments until no further improvement is obtained.

i. Disconnect the AN/USM–207 from the AN/GRM–50, and connect the AN/USM–207 to the

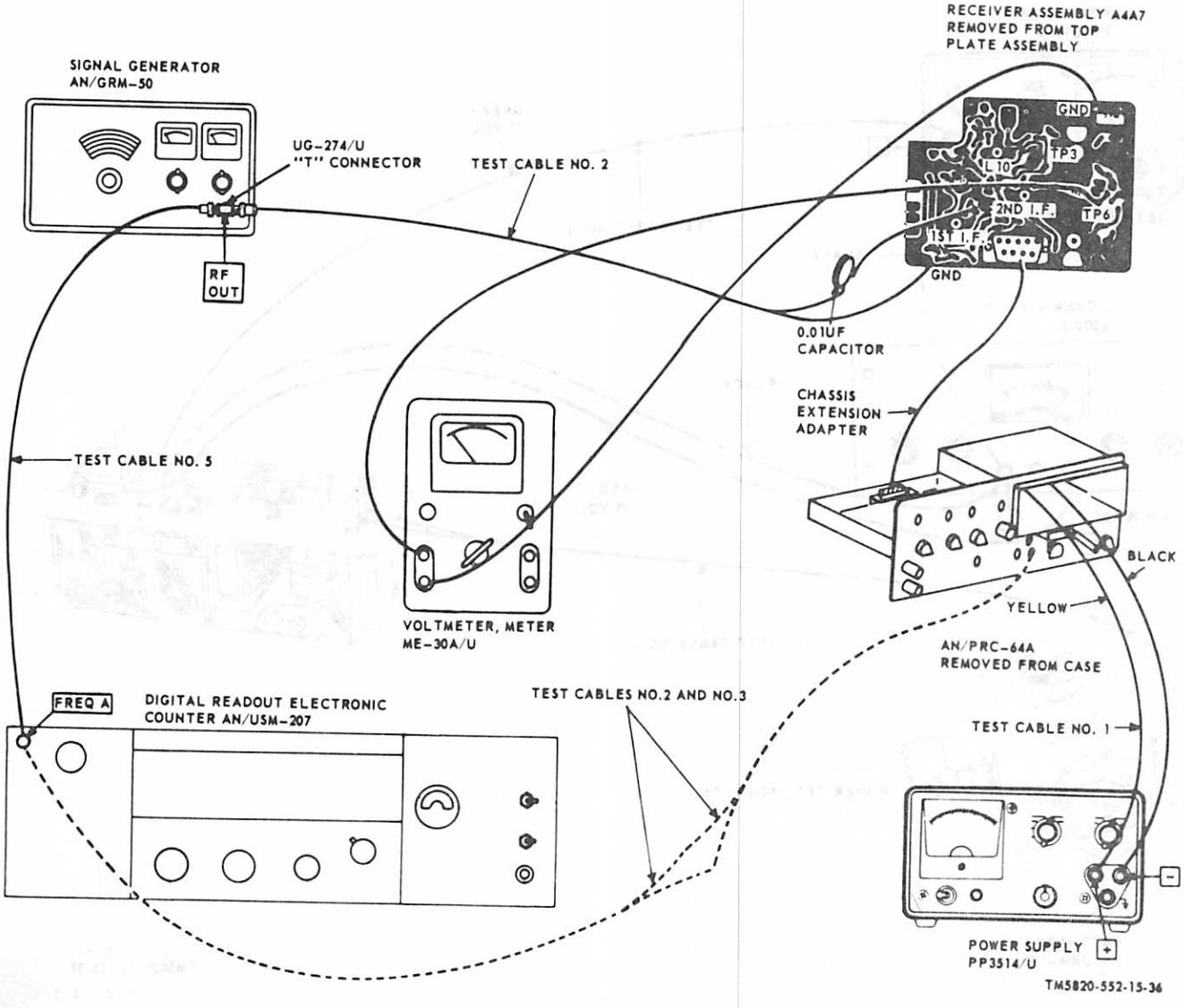


Figure 7–21. Receiver IF alignment, test setup.

PHONES jack of the AN/PRC–64A as shown by the dotted line in figure 7–21.

j. Set the AN/PRC–64A BFO control to its center (12 o'clock) position.

k. Align L10 for approximately zero Hz indication on the AN/USM–207.

7–14. Transmitter Alignment

a. Install transmitter crystals in each of the four channel positions (fig. 2–3). Most accurate alignment will result if crystals representing the center frequency of each channel are installed.

b. Connect test equipment as shown in figure 7–22.

NOTE

If equipment is available at this maintenance level, DA–75/U Dummy Electrical Load—Federal stock number 5985–280–3480 (rated 50 ohms, noninductive) may be used in place of the resistor shown in the arrangement in figure 7–22.

c. Set Radio Set AN/PRC–64A controls as follows:

(1) GAIN CONTROL: OFF
(2) REC–SEND: SEND

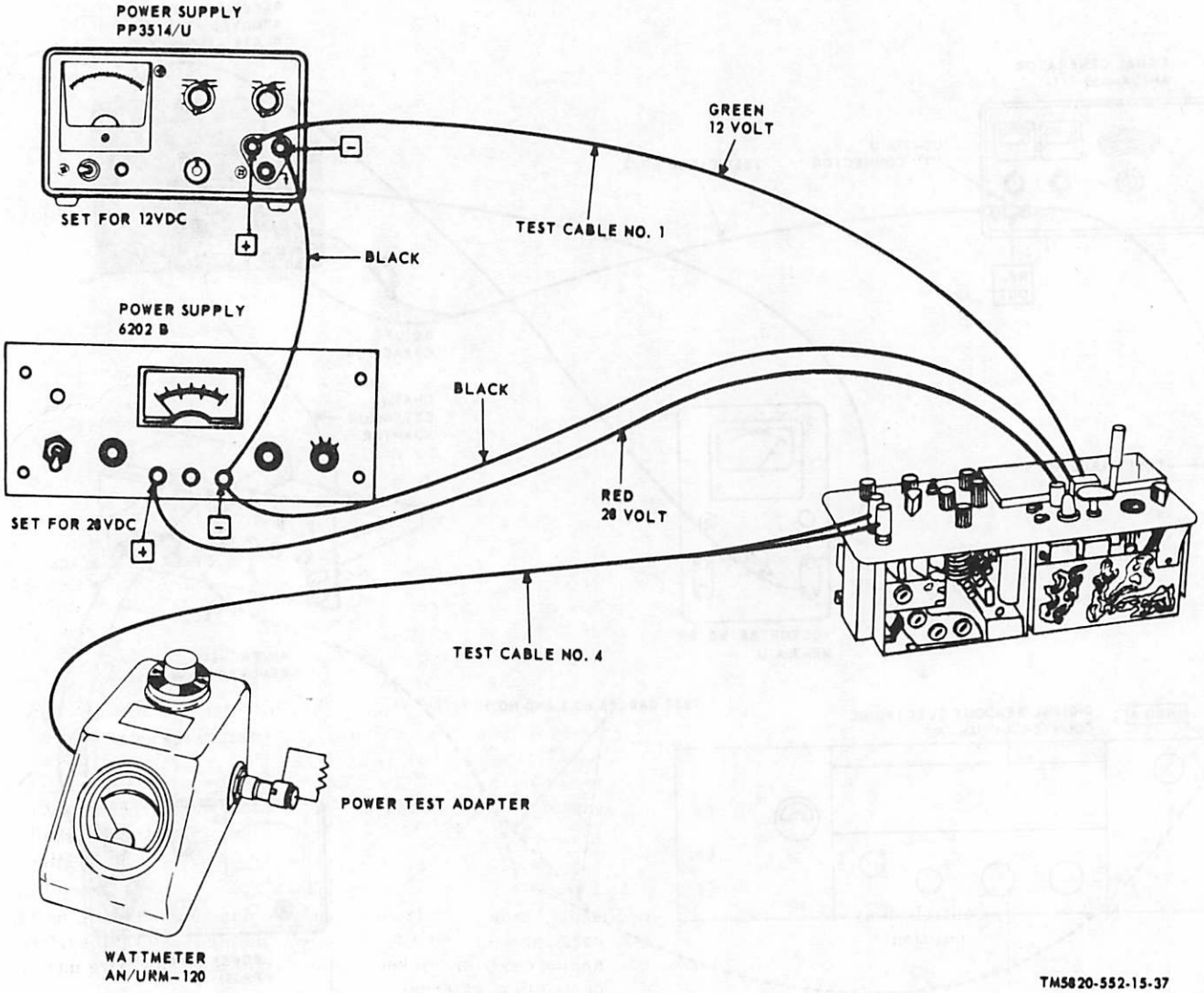


Figure 7–22. Transmitter alignment, test setup.

(3) LOADING: 1
(4) IND SENS: OFF
(5) Transmitter CHANNEL: 1
(6) AM-CW: CW
(7) All other controls: Any position.

d. Depress the radio set internal key, and while holding it down, adjust L1 and L5 (fig. 2-3) for maximum output on AN/URM-120.

e. Turn AN/PRC-64A AM-CW switch to AM and again adjust L1 only for maximum indication on AN/URM-120.

f. Turn AN/PRC-64A AM-CW switch to CW and transmitter CHANNEL switch to 2. Repeat *d* and *e* above adjusting L2 and L6 on CW and L6 only on AM.

g. Repeat *e* above for channel 3, adjusting L3 and L7 on CW and L7 only on AM.

h. Repeat *e* above for channel 4, adjusting L4 and L8 on CW and L8 only on AM.

i. With AN/PRC-64A transmitter CHANNEL switch on 4 and AM-CW switch on AM, adjust potentiometer A4A2R28 (fig. 7-12) for an indication of 2 watts on AN/URM-120.

Section IV. TESTING PROCEDURES

7-15. General

a. Testing procedures are prepared for use by ECOM General Support Maintenance shops and Service Organizations responsible for general support maintenance of electronic equipment. These procedures set forth specific requirements that repaired equipment *must* meet before it is returned to the using organization.

b. Comply with instructions preceding each chart before proceeding to the chart. Perform each step in sequence. Do not vary the sequence. For each step, perform all the actions required in the *Control settings* column; then perform each specific test procedure and verify it against its performance standard.

7-16. Test Equipment and Fabricated Cables

Test equipment required for tests is listed in paragraph 7-2. Cable fabrication instructions are illustrated in figure 7-1.

7-17. Physical Tests and Inspections

a. Test Equipment Required. None.

b. Test Connections and Conditions. Remove the battery from the AN/PRC-64A.

c. Procedure.

Step No.	Test equipment control settings	Equipment under test control settings	Test procedure	Performance standard
1	N/A	Controls may be in any position.	*a.* Inspect carrying bag for torn fabric, broken straps, broken clasps, and missing parts.	*a.* No torn fabric, broken straps, broken clasps or missing parts.
			b. Inspect contents of carrying bag against paragraph 1-6*a*.	*b.* Contents shall be as listed in paragraph 1-6*a*.
2	N/A	Controls may be in any position.	*a.* Inspect both antenna reels for bent reel, broken wire, or missing frequency markers.	*a.* Each reel shall be straight, and contain 96 feet of wire with frequency markers securely attached.
			b. Inspect transmission line reel for bent reel, broken wire, terminal block and missing binding post caps on terminal block.	*b.* Reel shall be straight and contain 35 feet of 75-ohm twin lead transmission line with terminal block on one end. Both binding post caps shall be fingertight on terminal block.
3	N/A	Controls may be in any position.	*a.* Remove radio set from carrying bag and examine case for broken or missing external parts, and condition of paint.	*a.* No damage or mising parts. Painted external surface will not show bare metal.

Step No.	Test equipment control settings	Equipment under test control settings	Test procedure	Performance standard
			Note. Touchup painting is recommended instead of refinishing, wherever practicable.	
			b. Examine storage compartment in case lid for condition of hinges and fasteners.	*b.* Storgae compartment hinges and fasteners in good condition and work properly.
			c. Examine contents of case	*c.* Case contents shall be in accordance with paragraph 1–6*a*.
			d. Examine each headset for completeness, and condition of cord and connectors.	*d.* Each headset shall consist of cord assembly, earphone, earpiece, and holder (fig. 1–2). Cord and connectors shall be free of worn, bent and broken parts.
			e. Examine microphone for completeness, and condition of cord and connectors.	*e.* Microphone assembly shall consist of holder, cord assembly and microphone (fig. 1–2) Cord and connectors shall be free of worn, bent and broken parts.
4	N/A	Controls may be in any position.	*a.* Examine ANT and GND binding posts. Depress each post.	*a.* Binding posts shall be free of broken parts. When depressed and released, each binding post shall spring back to original position.
			b. Operate all controls and switches.	*b.* All control knobs shall be tight and index properly. All controls shall operate freely.
			c. Unlock and remove dummy plug from KEY connector.	*c.* Dummy plug pins shall be straight. Dummy plug shall be attached by cord to top assembly retaining screw. After examination replace dummy plug and lock to KEY connector.
			d. Examine switch boots for cracks or tears.	*d.* Switch boots shall be free of cracks and tears.
			e. Examine indicator lamps for breaks and tightness.	*e.* Indicator lamps shall be unbroken and fingertight in sockets.
5	N/A	Controls may be in any position.	*a.* Unsnap battery cover and remove battery. Examine battery compartment and connector for corrosion.	*a.* Battery cover compartment and connector shall be free of corrosion.
			b. Replace battery if radio set is to be placed in use. Otherwise leave battery out. Replace battery and cover and snap shut.	*b.* Battery case cover fits correctly. Clamps work freely and fasten correctly.

7–18. Receiver Tests

a. Test Equipment and Materials.

(1) Power Supply PP–3514/U.

(2) Signal Generator AN/GRM–50.

(3) Meter, Audio Level TS–585/U.

(4) Digital Readout Electronic Counter AN/USM–207.

(5) Test Cable No. 1.

(6) Test Cable No. 2.

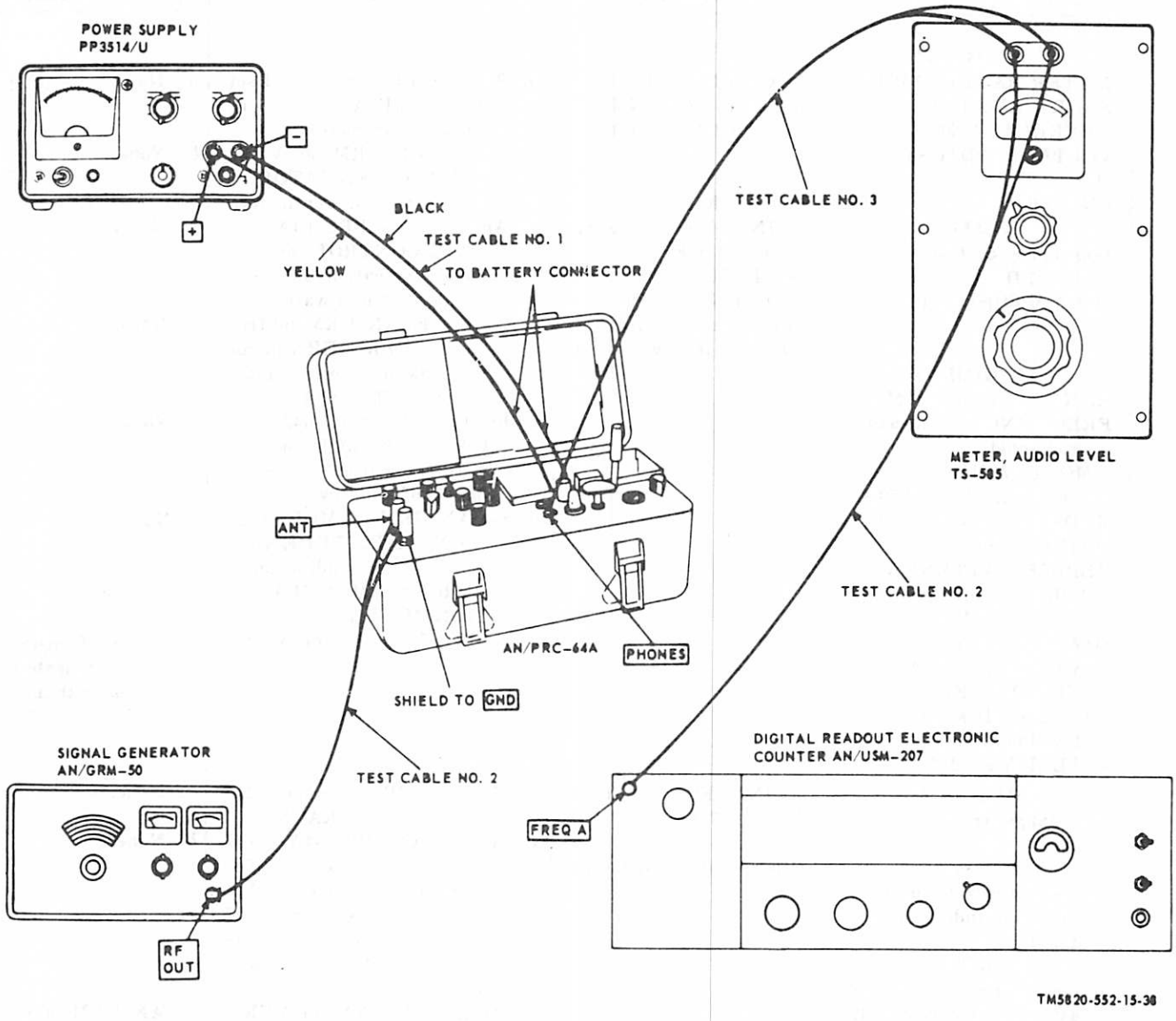


Figure 7-23. Receiver tests.

(7) Test Cable No. 3 or bench-fabricated cable (para 7-12).

(8) Test Cable No. 4.

b. Test Connections and Conditions.

(1) Remove battery from AN/PRC-64A.

(2) Be sure at least one receiver crystal has been installed and aligned in receiver section of AN/PRC-64A.

(3) Connect equipment as shown in figure 7-23.

(4) Allow a 5-minute warmup of AN/GRM-50.

c. Procedure.

Step No.	Test equipment control settings	Equipment under test control settings	Test procedure	Performance standard
1	*PP-3514/U* METER RANGE: 10VDC SHORT CIRCUIT CURRENT: 25MA VOLTAGE ADJUST Min. (CW) ON: off *TS-585U* Impedance control: 60 (x10) Meter Multiplier: 1 *AN/GRM-50* RANGE: 1.76-6.0 MC FREQUENCY: Receiver channel MODULATION SELECTOR: INT 1000~ MODULATION AMPLITUDE: ccw VERNIER ATTENUATOR: 10 microvolts *AN/USM-207* POWER: STBY SENSITIVITY: 1 V FUNCTION: FREQ. DISPLAY: Desired display time GATE TIME: 10'	REC SEND: REC Receiver: CHANNEL: channel to be tested BFC: OFF BW: 6 KC GAIN: Maximum ccw, but not OFF. LOADING: 1 IND SENS: OFF Transmitter controls may be in any position	*a.* Turn on PP-3514/U and set VOLTAGE ADJUST for 4.0 volts on meter. *b.* Adjust AN/GRM-50 VERNIER ATTENUATOR for 5 microvolts on meter. *c.* Advance AN/PRC-64A GAIN CONTROL for a meter indication on TS-585/U of 1 milliwatt. *d.* Adjust the AN/GRM-50 frequency VERNIER control for maximum meter indication on TS-585A. *e.* Readjust AN/PRC-64A GAIN CONTROL for a meter indication on TS-585/U of 1 milliwatt. *f.* Set AN/GRM-50 MODULATION AMPLITUDE control for zero reading on PERCENT MODULATION METER. *g.* Set TS-585/U meter Multiplier to 0.1.	*a.* None. *b.* None. *c.* None. *d.* None. *e.* None. *f.* None. *g.* TS-585/U meter shall indicate no greater than 1.5.
2	*PP-3514/U* No change from step 1. *TS-585/U* Leave controls in positions last indicated in step 1. *AN/GRM-50* Leave controls in positions last indicated in step 1. *AN/USM-207* No change from step 1.	GAIN: Fully clockwise BW: 0.5 KC Other controls same as step 1.	*a.* Set POWER switch on AN/USM-207 to TRACK. *b.* Adjust AN/PRC-64A BFO control for indication of 1.000 kHz on AN/USM-207. Adjust AN/USM-207 SENSITIVITY control, as required for consistent display. *c.* Adjust AN/GRM-50 VERNIER ATTENUATOR for an indication of 10 on TS-585/U meter.	*a.* None. *b.* None. *c.* AN/GRM-50 voltmeter shall indicate less than 3 microvolts.
3	*PP-3515/U* No change from step 2. *TS-585/U* No change from step 2. *AN/GRM-50* Leave controls in positions indicated in step 2. *AN/USM-207* POWER: Set to OFF.	Leave all controls in positions last indicated in step 2.	*a.* Unplug TS-585/U from PHONES jack of AN/PRC-64A, and plug in to same jack one of the AN/PRC-64A headsets. Listen to the tone in the headset. *b.* While listening in headset, vary position of AN/PRC-64A GAIN CONTROL from maximum to minimum. *c.* Unplug headset, and plug it into other PHONES jack of AN/PRC-64A. Repeat *a* and *b* above.	*a.* 1,000 Hz tone shall be heard in headset. *b.* Tone heard in headset shall vary in intensity from maximum heard in *a* above to inaudible. *c.* Same as *a* and *b* above.

Step No.	Test equipment control settings	Equipment under test control settings	Test procedure	Performance standard
			d. Repeat steps *a* and *b* above using other headset.	*d.* Same as *a* and *b* above.

7–19. Transmitter Tests

a. Test Equipment and Materials.

(1) Power Supply PP–3514/U.
(2) Power Supply PP–3940/G.
(3) Wattmeter AN/URM–120 with coupler CU–753/URM–120.
(4) Signal Generator AN/USM–205.
(5) Power Test Adapter.
(6) Test Cable No. 1.
(7) Test Cable No. 3 or bench-fabricated cable (para 7–12).
(8) Test Cable No. 4.
(9) Test Cable No. 5.
(10) Optional Oscilloscope.

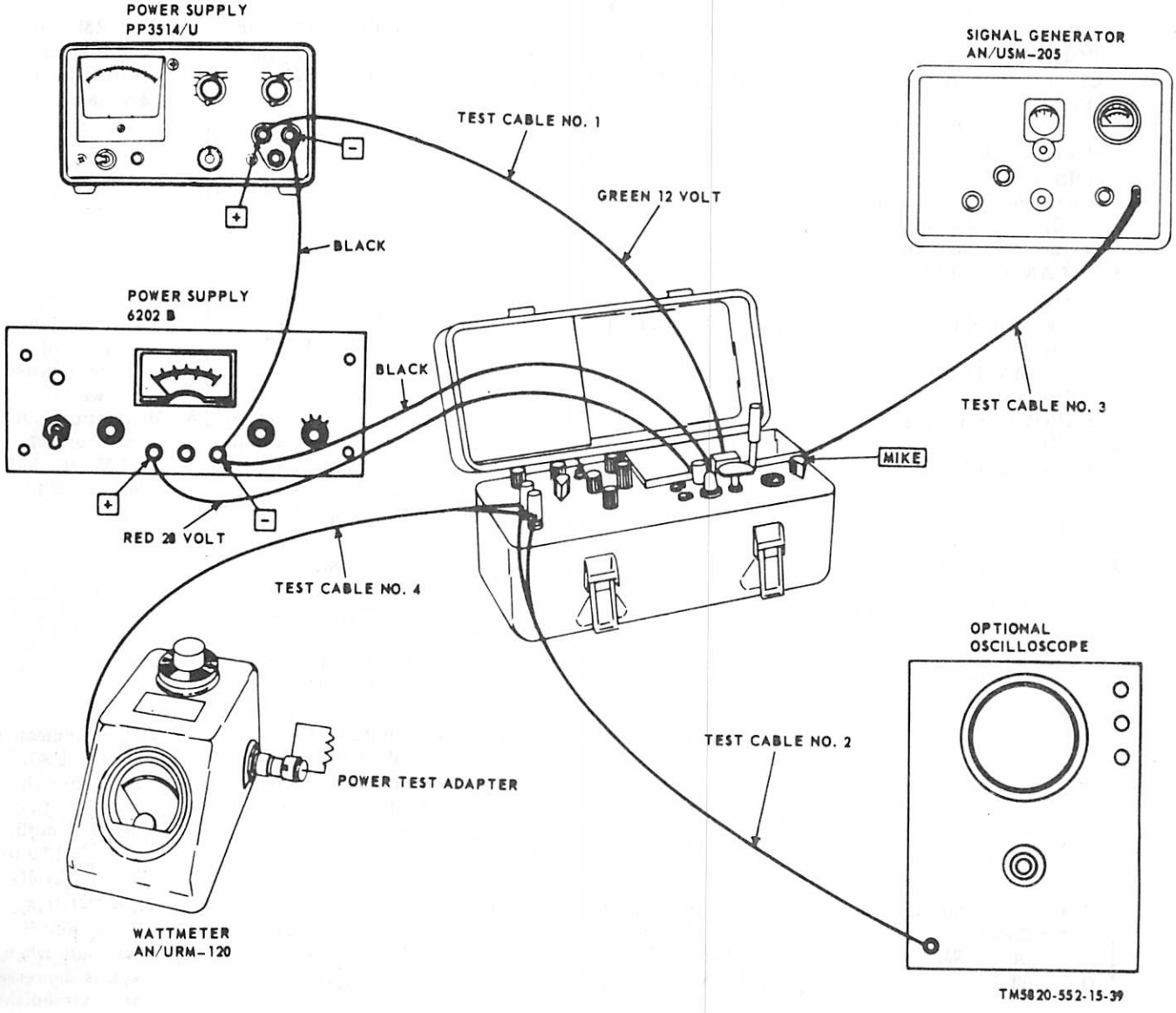


Figure 7–24. Transmitter tests.

b. Test Connections and Conditions.

(1) Remove battery from AN/PRC-64A.

(2) Install coupler CU-753/URM-120 with arrow pointing toward power test adapter.

(3) Be sure at least one transmitter crystal has been installed and aligned in transmitter section of AN/PRC-64A.

(4) Connect equipment as shown in figure 7-24.

NOTE

For optional method to using test cable No. 3, refer to the note appearing after paragraph 7-12*b* in receiver RF alignment.

c. Procedure.

Step No.	Test equipment control settings	Equipment under test control settings	Test procedure	Performance standard
1	*PP-3514/U* METER RANGE: 30VDC SHORT CIRCUIT CURRENT: 100 MA VOLTAGE ADJUST: Min. (ccw) ON: OFF *PP-3940/G* METER: 50 VOLTAGE: Min(ccw) CURRENT: Min(ccw) ON: OFF *AN/URM-120* Power range: 50 watts RMS VOLTS: .01 Amplitude: 0 on meter *Optional oscilloscope* Set up to display frequency of AN/PRC-64A channel being used.	RECEIVER GAIN CONTROL: OFF Other receiver controls may be in any position REC SEND: SEND LOADING: 1 IND SENS: OFF CHANNEL: channel being used Internal key: up WHISPER: OUT AM-CW: CW	*a.* Turn PP-3514/U ON switch to ON. Adjust VOLTAGE ADJUST for 12 volts on meter. *b.* Turn PP-3940/G ON switch to ON and adjust VOLTAGE and CURRENT for 28 volts on meter. *c.* Depress AN/PRC-64A internal key and observe indication on AN/USM-205 meter.	*a.* None. *b.* None. *c.* AN/URM-120 meter shall read at least 4.5 watts.
2	Same as last indicated in step 1. *AN/USM-205* ON: ON FREQUENCY range: X 1KC FREQUENCY: 1.0	Same as last indicated in step 1.	*a.* Turn AN/PRC-64A AM-CW switch to AM. *b.* Rotate amplitude control on AN/USM-205 for an indication of 8 millivolts on meter. Calculate percent modulation from the formula: $\text{PCT MOD} = 141 \left(\frac{\text{Power, modulated}}{\text{Power, unmodulated}} - 1\right)$ or observe modulation envelope on oscilloscope. *c.* Place AN/PRC-64A WHISPER switch to IN position. *d.* Reduce amplitude control on AN/USM-205 for minimum indication where 90% modulation is still obtained.	a. AN/URM-120 meter shall indicate at least 1¼ watts. *b.* Modulation indicated on AN/USM-205 shall be 90% ± 10%. *c.* None. *d.* Voltage indicated on AN/USM-205 meter shall read 7 to 13 db below 8 millivolts or 1.79 to 3.57 millivolts.
3	Same as last indicated in step 2 except: *AN/USM-205* ON: off	Same as last indicated in step 2 except: AM-CW: CW IND SENS: 3	*a.* Depress internal key on AN/PRC-64A and observe ANT INDICATOR.	*a.* ANT INDICATOR shall illuminate when key is depressed and extinguish when key is released.

Step No.	Test equipment control settings	Equipment under test control settings	Test procedure	Performance standard
			b. Place AN/PRC-64A IND SENS switch in position 2 and repeat *a* above.	*b.* Same as *a* above.
			c. Place AN/PRC-64A IND SENS switch in position 1 and repeat *a* above.	*c.* Same as *a* above.
			d. Place AN/PRC-64A IND SENS switch in OFF position and repeat *a* above.	*d.* ANT INDICATOR shall not illuminate with key depressed or not depressed.
4	Same as last indicated in step 3.	Same as last indicated in step 3.	Depress AN/PRC-64A key and battery interlock switch at same time.	No indication on AN/URM-120 meter.
5	Same as last indicated in step 4.	Same as last indicated in step 4.	*a.* Depress BAT. TEST switch and observe battery test indicator.	*a.* Battery test indicator shall illuminate.
			b. Reduce indicated voltage on PP-3940/G to 21.5 volts and repeat *a*.	*b.* Same as *a* above.
			c. Reduce indicated voltage on PP-3940/G to 18.5 volts and repeat *a*.	*c.* Battery test indicator shall not illuminate.
			d. Increase indicated voltage on PP-3940/G to 28 volts.	*d.* None.
6	Same as last indicated in step 5.	Same as last indicated in step 5.	Plug headset into AN/PRC-64A and place earphone in ear. Depress AN/PRC-64A internal key.	Sidetone shall be present in earphone.
7	Same as last indicated in step 6.	Same as last indicated in step 6.	Plug AN/PRC-64A microphone into MIKE jack and speak into microphone while observing AN/URM-120 or optional oscilloscope.	AN/URM-120 meter indication shall vary with speech. Optional oscilloscope shall indicate modulation of carrier.

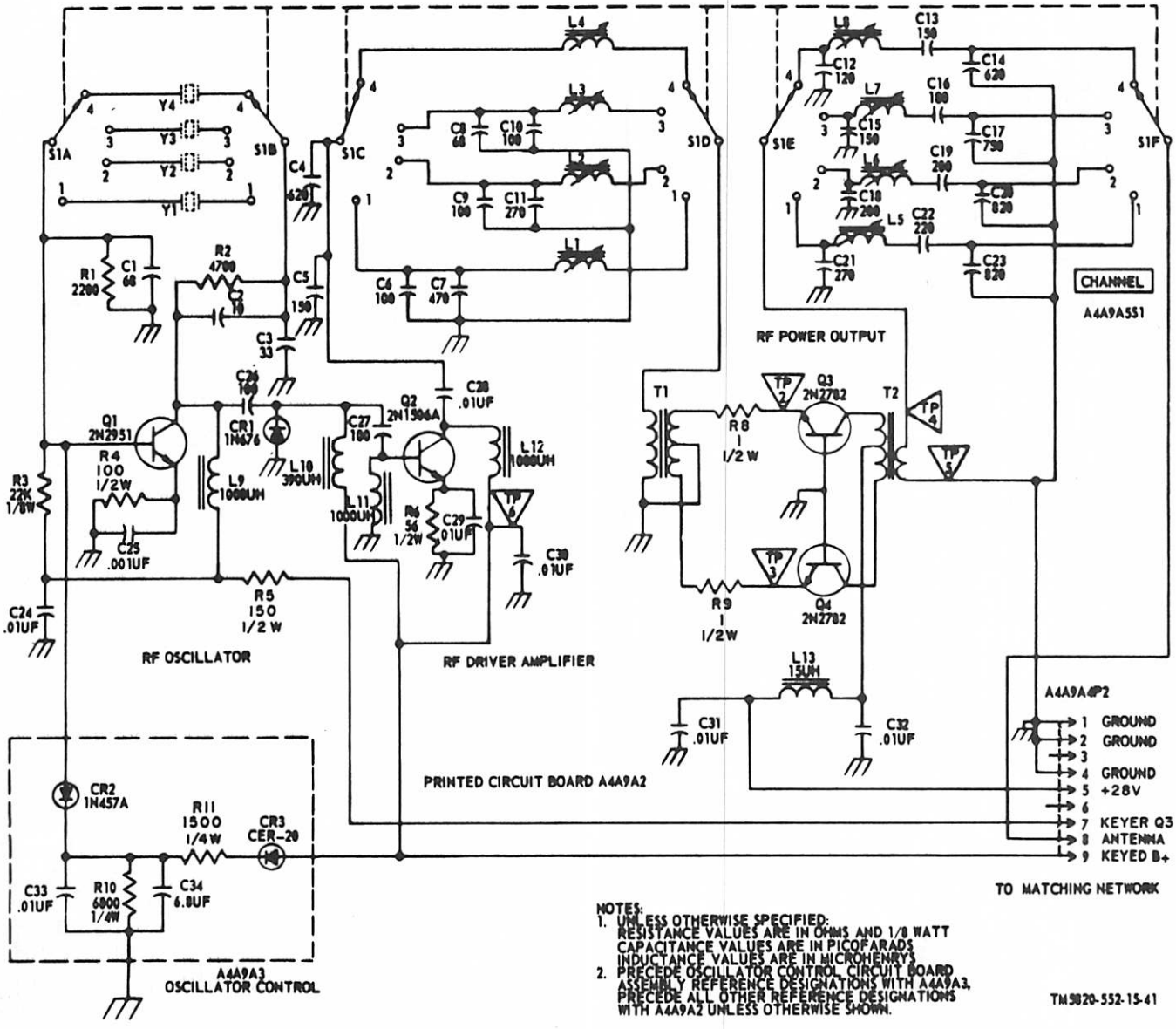


Figure 7-26. Schematic diagram, transmitter assembly A4A9, Radio Set AN/PRC-64A.

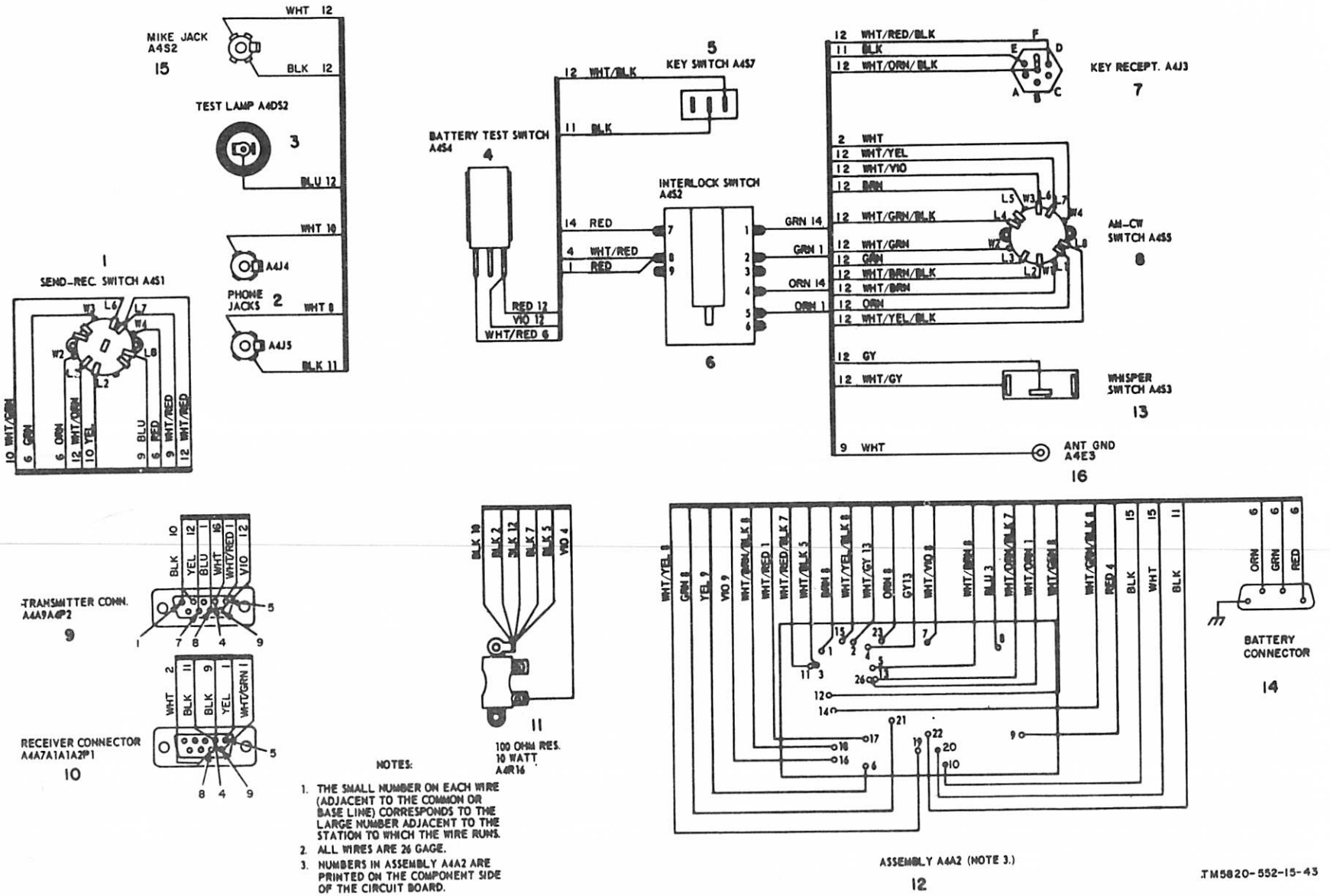


Figure 7–28. Wiring harness, Radio Set AN/PRC–64A.

CHAPTER 8

DEPOT OVERHAUL STANDARDS

8-1. Applicability of Depot Overhaul Standards

Radio Set AN/PRC-64A must be tested thoroughly after overhaul, rebuild, and repair to insure that it meets adequate performance standards before being reissued or returned to stock. Use the tests described in this chapter to measure the performance of the repaired Radio Set AN/PRC-64A. It is mandatory that repaired equipment to be reissued, or returned to stock for reissue meet all of the performance standards given in this chapter. Units that pass these tests meet the same specifications as new units of the same kind.

NOTE

The following test procedures should not be used to test the performance of *new* equipment, that is, equipment that has not been repaired or rebuilt. Such equipment should be tested in conformance with the electrical and operational tests defined in the contract under which the equipment was manufactured including any waivers and/or changes to the Specifications that were imposed upon or granted to the particular manufacturer of the equipment.

8-2. Applicable References

a. Repair Standards. Applicable procedures of the depots performing these tests and the general standards for repaired electronic equipment given in TB SIG 355-1, TB SIG 355-2, and TB SIG 355-3, form a part of the requirements for testing this equipment.

b. Technical Publications. In addition to the references cited in *a* above for procedures and general standards for repaired electronic equipment, also applicable to the equipment to be tested, refer to DA Pam 310-4.

c. Modification Work Orders. Perform all modification work orders applicable to this equipment before making the tests specified. DA Pam 310-7 lists all available MWO's.

8-3. Test Equipment Required

The items of test equipment that are required to perform the tests set forth in this chapter are listed below and are not given at the beginning of each test procedure (paras 8-5 through 8-12). For specific items of test equipment used in each test refer to the applicable illustration of the test setup.

a. Test Equipment.

Test equipment	*Technical manual*
Signal Generator, AN/GRM-550	TM 11-6625-573-15
Power Supply PP-3514/U	TM 11-6625-617-12
Power Supply PP-3940/G	TM 11-6130-247-15
Wattmeter, AN/URM-120	TM 11-6625-446-15
Digital Readout Electronic Counter AN/USM-207.	TM 11-6625-700-10
Voltmeter, Electronic ME-30A/U	TM 11-6625-320-12
Spectrum Analyzer, TS-723A/U	TM 11-5097
Multimeter, TS-352/U	TM 11-6625-366-15
Oscilloscope, AN/USM-281A	TM 9-6625-2362-12
Signal Generator, AN/USM-205	TM 11-6625-665-15
RF Interference Measuring Set, AN/URM-85.	TM 11-6625-351-12
Audio Power Meter TS-585	TM 11-5017

b. Special Test Harnesses. The special test cables, adapters, and extensions shown in chapter 7 (fig. 7-1) will speed up the testing of Radio Set AN/PRC-64A.

c. Testing Procedure. Comply with the instructions preceding each test procedure section before performing the steps themselves. Perform each step in the sequence indicated. Do not vary the sequence. Observe the proper control settings for each step and perform each specific procedure and varify it against its performance standard.

8-4. Test Frequencies

In most cases, tests made on the center frequency of each receive and transmit channel will be adequate. However, if RF coils have been changed during the course of repair or rebuilding, tests should be conducted at the highest and lowest frequencies of the affected channels to be sure that proper frequency tracking has been achieved. In all the tests that follow, it is assumed that the Radio Set AN/PRC-64A has been carefully aligned in accordance with instructions provided in chapter 7.

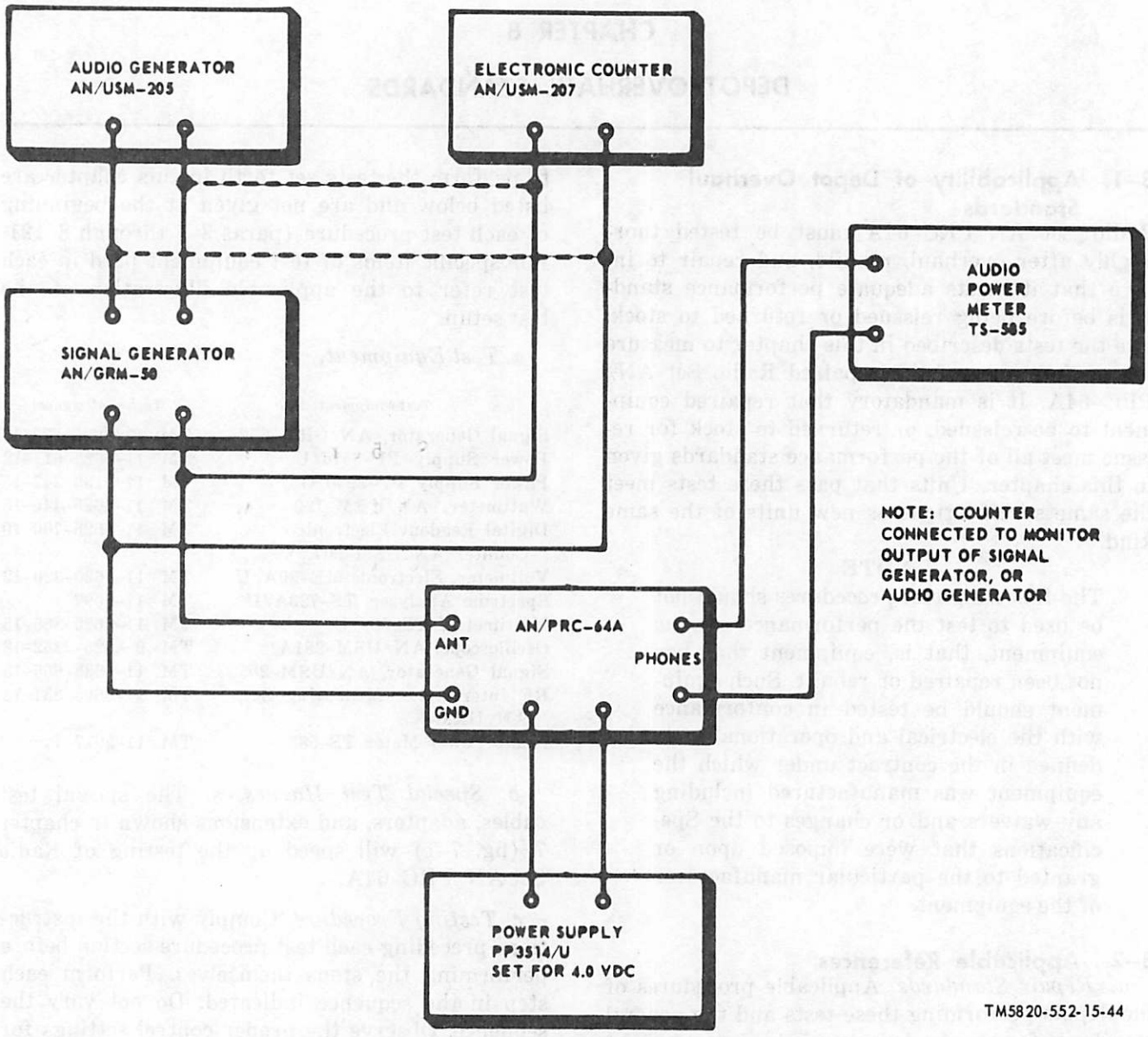


Figure 8–1. Receiver IF and audio tests, test setup.

8–5. Receiver RF, IF and Audio Tests

a. Receiver AM Sensitivity, Frequency Stability, Image Rejection Ratio and Audio Tests.

(1) Connect the test equipment and equipment under test as shown in figure 8–1.

(2) Set the AN/GRM–50 controls as follows:

POWER: ON (allow 10 minute warmup)
PERCENT MODULATION: Fully counterclockwise on MODULATION AMPLITUDE control
RANGE: 1.76—6.0 MC
FREQUENCY: Desired channel frequency
MODULATION SELECTOR: 30 percent at 1000 Hz

(3) Set the AN/PRC–64A controls as follows:

REC–SEND: REC
Receive CHANNEL: Desired channel
BFO: OFF
BW: 6KC
GAIN CONTROL: Maximum clockwise
LOADING control: Extreme counterclockwise position
WHISPER: OUT

(4) Set the TS-585/U controls as follows: Impedance control: 60 in X10 quadrant Meter multiplier: 1

(5) Set the AN/GRM-50 VERNIER control for an output of 5 microvolts (5 on top scale), 1000 Hz modulated 30 percent, at channel frequency, using the MODULATION AMPLITUDE control, as indicated by maximum output on the TS-585/U.

(6) TS-585/U shall indicate a minimum of 5 milliwatts.

(7) Adjust the AN/PRC-64A GAIN CONTROL for an output of 1 milliwatt (10 on the lower scale) as indicated on the TS-585/U.

(8) Adjust the output of AN/GRM-50 by rotating the VERNIER to obtain a consistent reading on AN/USM-207.

(9) Frequency indicated on AN/USM-207 shall be within 0.08 percent of the nominal channel frequency.

(10) Adjust the frequency of AN/GRM-50 as monitored by the AN/USM-207 to channel frequency plus 910 kHz.

(11) Adjust AN/GRM-50 MICROVOLT control for an output of 1 milliwatt (10 on the lower scale) on the TS-585/U.

(12) Output meter of AN/GRM-50 shall indicate 45 db or greater output than 5 microvolts (read off the top scale).

(13) Readjust the AN/GRM-50 to channel frequency with an output of 5 microvolts (read off the scale), modulated 30 percent at 1000 Hz and adjust the output for an indication of 1 milliwatt (10 on the lower scale) on the TS-585/U.

(14) Turn the MODULATION AMPLITUDE control fully counterclockwise on AN/GRM-50.

(15) Output indication on the TS-585/U shall be at least 10 db lower than 1 milliwatt indicating a S + N/N ratio of 10 db with a power output of 1 milliwatt.

(16) Set the AN/PRC-64A CHANNEL switch to channels 2, 3, and 4 and repeat sets (5) through (15) above each time, making appropriate changes in tuning on the AN/GRM-50 to correspond to the channel selected.

b. Receiver CW Sensitivity and BFO Tests.

(1) Leave all control and test equipment settings as in *a*.(2), (3), and (4) above except for the following:

AN/GRM-50:

MODULATION SELECTOR: 1000 Hz unmodulated

AN/PRC-64A:

BW: 0.5 KC

GAIN CONTROL: Maximum clockwise

TS-585-U:

Meter Multiplier: 1

Impedance control; 60 in X10 quadrant

AN/USM-207:

POWER: ON (TRACK)

DISPLAY TIME: Maximum counterclockwise

FREQUENCY UNIT: 1

FUNCTION SELECTOR: FREQUENCY

GAIN: MAX.

(2) Connect the AN/USM-207 to the input of the TS-585/U.

(3) Adjust AN/PRC-64A BFO control for an indication of 1000 Hz on the AN/USM-207.

(4) Adjust the AN/GRM-50 unmodulated output for an indication of 1 milliwatt (10 on lower scale) on the TS-585/U.

NOTE

If the TS-585/U meter reads 1 milliwatt or less with the AN/PRC-64A GAIN CONTROL at fully clockwise and signal generator modulation at zero, leave the GAIN CONTROL at that setting.

(5) AN/GRM-50 meter shall indicate less than 2 microvolts.

(6) Set Radio Set AN/PRC-64A BFO control to OFF.

(7) Set the AN/GRM-50 output for 1 millivolts, unmodulated, by rotating the ATTENUATOR control to the desired output voltage.

(8) TS-585/U shall indicate no output.

(9) Advance Radio Set AN/PRC-64A BFO control slightly clockwise just sufficiently to activate the BFO.

(10) Adjust frequency of AN/GRM-50 for a maximum indication on TS-585/U, reducing the output as necessary to obtain a peak reading with frequency adjustment.

(11) Note the frequency on the AN/USM-207.

(12) Set the Radio Set AN/PRC-64A BFO control fully clockwise and note the frequency on AN/USM-207.

(13) Difference in frequency between indications in (11) and (12) above shall not be less than 2500 or more than 4000 Hz.

c. Receiver RF Gain Control Test.

(1) Leave test equipment connected as in *a* above and position Radio Set AN/PRC-64A controls as in *a* (3) above.

(2) Set the AN/GRM-50 for 1000 Hz at 30 percent modulation and adjust the output for

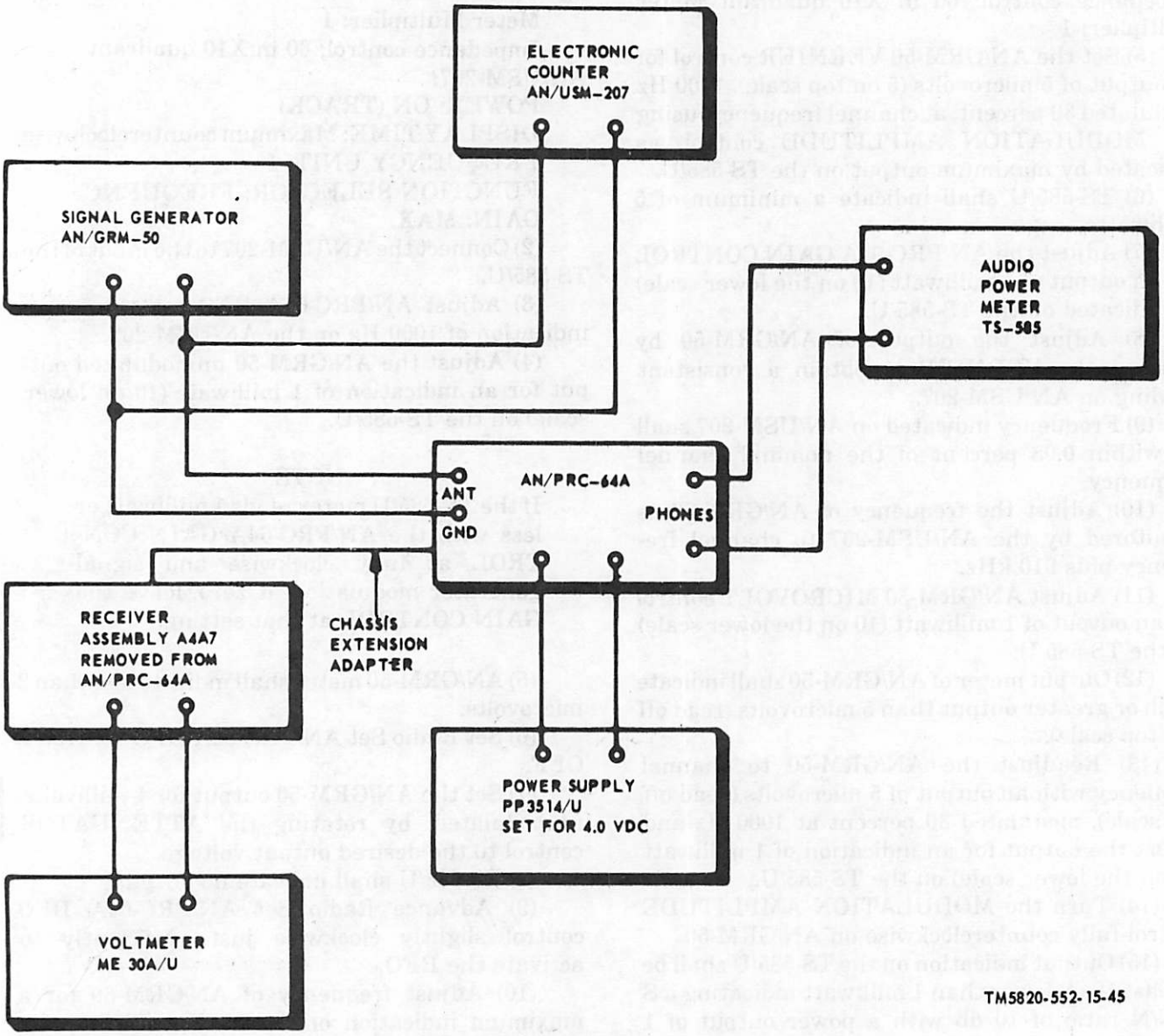


Figure 8-2. Receiver bandwidth test, test setup.

an indication of 1 milliwatt as indicated on the TS-585/U. Note the indication on the AN/GRM-50 output meter and record it.

(3) Rotate the AN/PRC-64A GAIN CONTROL to the extreme counterclockwise (minimum) position without turning receiver off.

(4) Increase the output of AN/GRM-50 until 1 milliwatt is indicated on TS-585/U.

(5) Note AN/GRM-50 output meter which should indicate 100,000 times the indication in (2) above, that is approximately 1 volt.

d. Receiver IF Stage Gain Test and IF Image Rejection.

(1) Leave test equipment as in *a* above and position Radio Set AN/PRC-64A controls as in *a* (3) above.

(2) Connect the AN/USM-207 to monitor the frequency of the AN/GRM-50, as shown in figure 8-1.

(3) Set the frequency of the AN/GRM-50 to 455 kHz, 1000 Hz 30 percent modulation, and adjust output of the AN/GRM-50 for approximately 20,000 microvolts.

(4) Rotate FREQUENCY VERNIER control of AN/GRM-50 to obtain a maximum indication on the TS-585/U. Reduce or increase the output of the AN/GRM-50 for an indication on

the TS–585/U of 1 milliwatt and note indication on the output meter of the AN/GRM–50.

(5) Frequency observed on the AN/USM–207 shall be 455 kHz ± 2 kHz.

(6) AN/GRM–50 output as observed on its output meter shall be at least 80 db above 5 microvolts.

8–6. Receiver Bandwidth Test

a. Connect the test equipment as shown in figure 8–2. The receiver must be removed from the Radio Set AN/PRC–64A and reconnected to the top plate assembly by using the chassis extension adapter (fig. 7–1).

b. Position the AN/PRC–64A controls the same as in paragraph 8–5*a*(3).

c. Set the AN/GRM–50 controls to the channel frequency as indicated on the AN/USM–207.

d. Adjust the output of the AN/GRM–50 for an indication of 24.5 millivolts on the ME–30A/U.

e. Increase the output of the AN/GRM–50 by 6 db.

f. Increase the frequency of the AN/GRM–50 until an indication of 24.5 millivolts is again obtained on the ME–30A/U. Record the frequency indication on the AN/USM–207.

g. Decrease the frequency of the AN/GRM–50 below channel frequency until an indication of 24.5 millivolts is again observed on the ME–30A/U.

h. Record the frequency indicated on the AN/USM–207.

i. Subtract the frequency recorded in *h* above from the frequency recorded in *f* above. The difference shall be 6.0 kHz or greater.

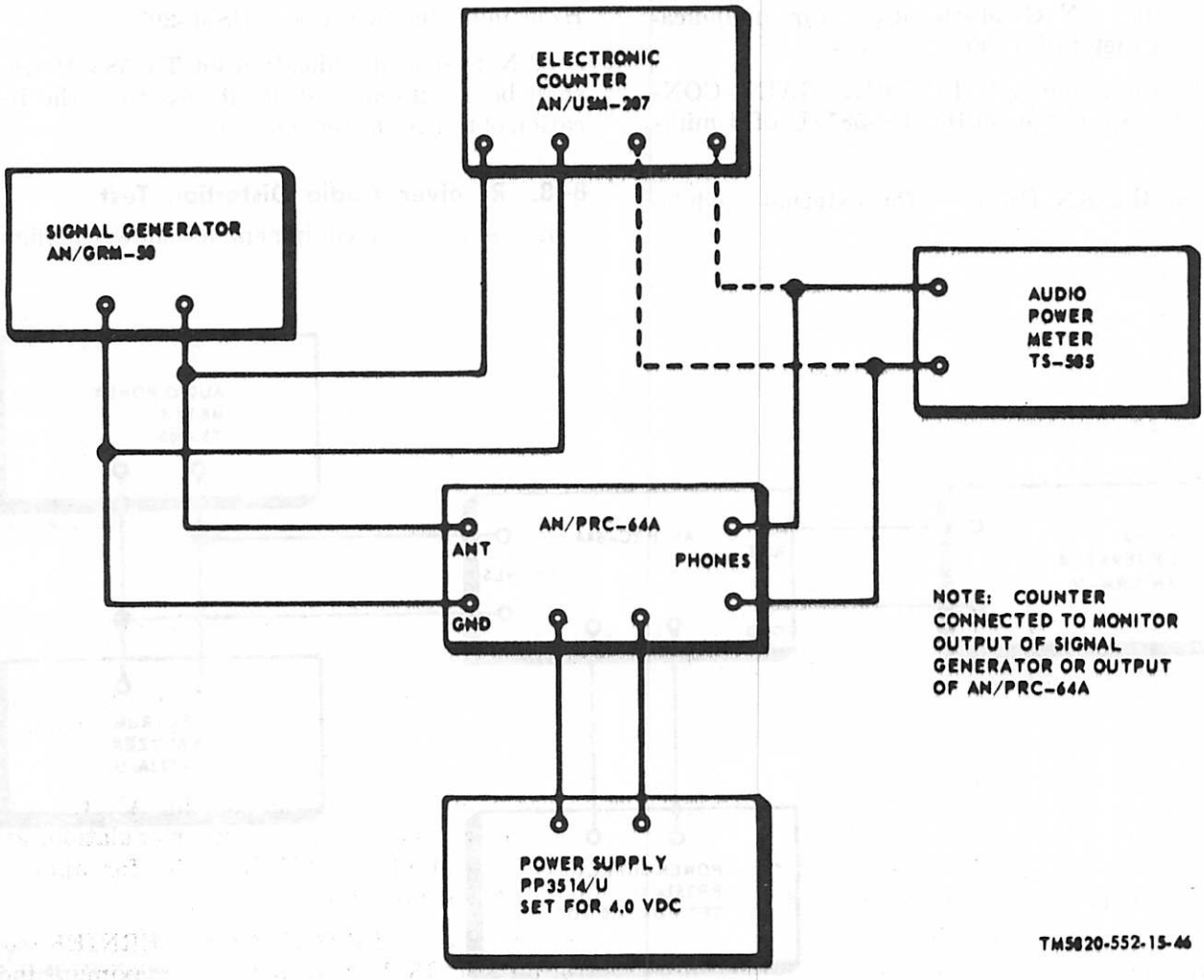


Figure 8–3. Receiver audio response test, test setup.

j. Repeat steps *d* through *i* above 60 db instead of 6 db. The difference recorded shall be 12.0 kHz maximum.

k. Place the Radio Set AN/PRC-64A BW switch in the 0.5 kHz position.

l. Adjust the frequency of AN/GRM-50 slowly for maximum indication on the ME-30A/U. Readjust the output of the AN/GRM-50 to maintain a 24.5 millivolt indication on the ME-30A/U.

m. Repeat steps *e* through *i* above. The difference shall be 350-750 Hz.

8-7. Receiver Audio Response Test

a. Connect the test equipment as shown in figure 8-3 and position the Radio Set AN/PRC-64A controls the same as in paragraph 8-5*a*(3).

b. Set the AN/GRM-50 to the channel frequency as indicated on the AN/USM-207.

c. Set the AN/GRM-50 output for an indication on its meter of 5,000 microvolts.

d. Position the AN/PRC-64A GAIN CONTROL for an output on the TS-585/U of 4 milliwatts.

e. Set the AN/GRM-50 for external modulation.

f. Adjust the frequency of the AN/USM-205 for 1000 Hz as indicated by the AN/USM-207 connected to the output of the AN/USM-205.

g. Adjust the output of the AN/USM-205 until 1 milliwatt is indicated on the TS-585/U.

h. Readjust the frequency of the AN/USM-205 for 300 Hz as indicated by the AN/USM-207.

i. Output indicated by the TS-585/U shall be within 5 db of the indication in step *g* above.

j. Readjust frequency of AN/USM-205 for 2000 Hz as indicated by the AN/USM-207.

k. Note indication on TS-585/U which shall be within 5 db of the indication in step *g* above.

l. Scan frequency range of the AN/USM-205 between 300 and 2000 Hz, noting output on TS-585/U. Output at any frequency between 300 and 2000 Hz shall be within 5 db of indication in step *g*.

m. Set frequency of AN/USM-205 for 3500 Hz as indicated by the AN/USM-207.

n. Note output indication on TS-585/U which shall be a minimum of 10 db less than the indication obtained in step *g* above.

8-8. Receiver Audio Distortion Test

a. Connect test equipment as shown in figure

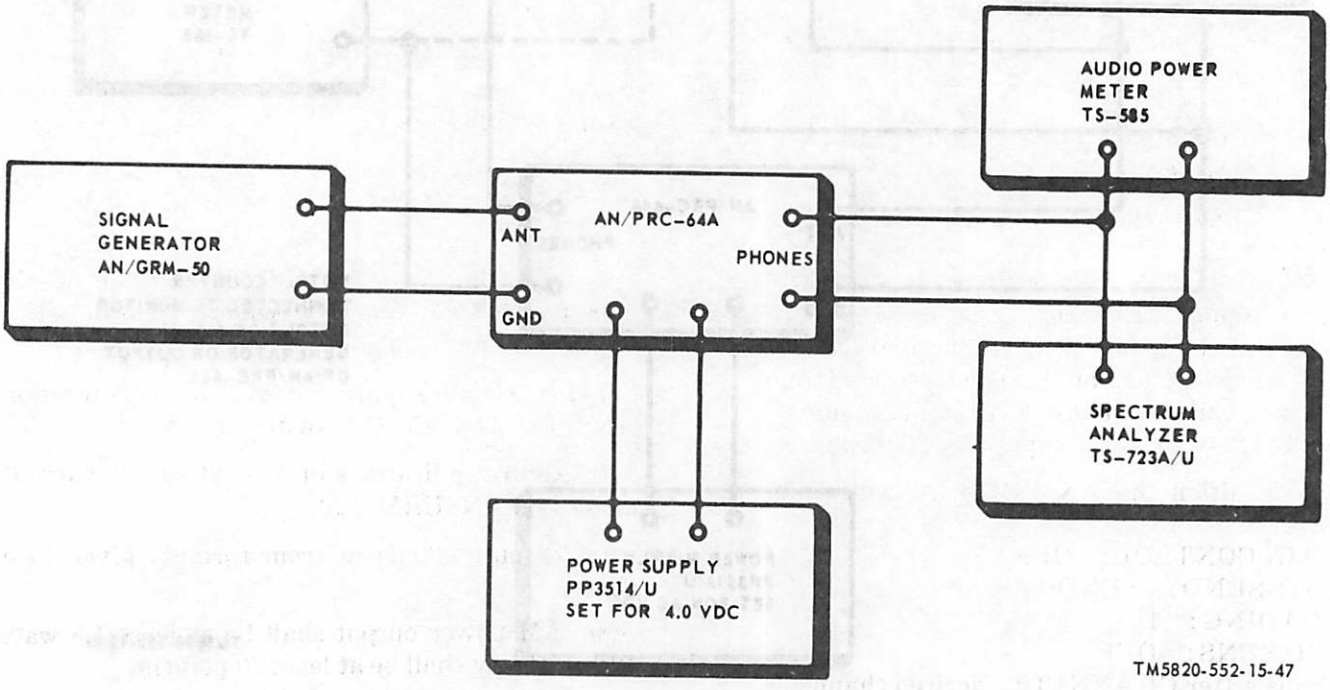


Figure 8-4. Receiver audio distortion test, test setup.

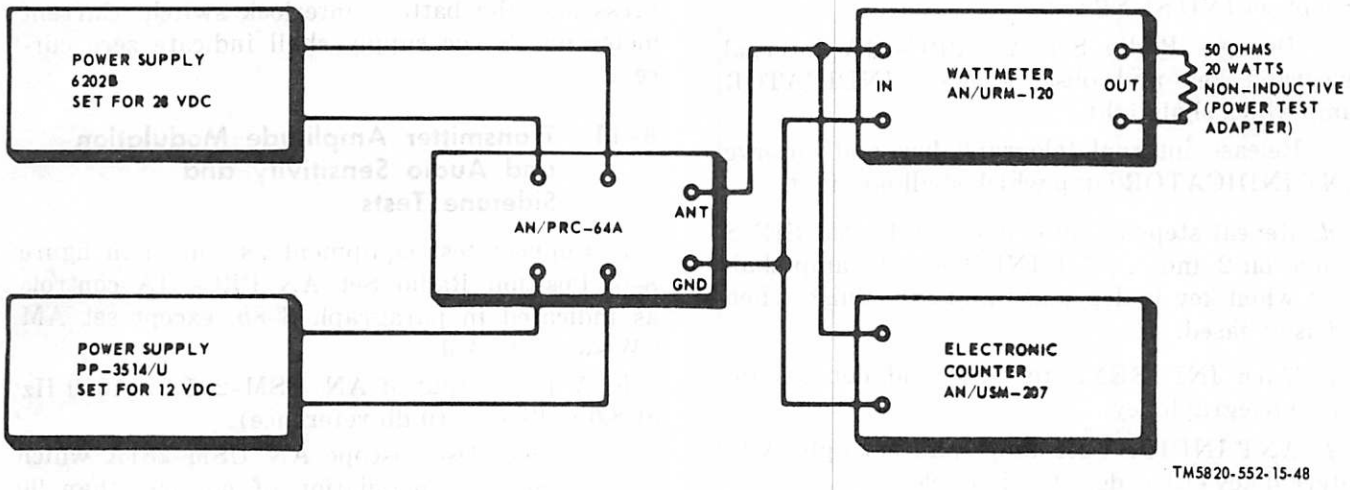


Figure 8–5. Transmitter power output and frequency tests, test setup.

8–4 and position the Radio Set AN/PRC–64A controls the same as in paragraph 8–5*a*(3).

b. Set AN/GRM–50 for 5 microvolts output at channel frequency, modulated 30 percent at 1000 Hz.

c. Reduce Radio Set AN/PRC–64A receiver GAIN CONTROL, if necessary, for an indication on TS–585/U of 4 milliwatts.

d. Adjust and null TS–723A/U for distortion measurement.

e. Total harmonic distortion indication shall be less than 10 percent.

8–9. Transmitter Power Output and Frequency Tests

a. Connect the test equipment as shown in figure 8–5.

NOTE

Dummy Electrical Load DA–75/U (rated 50 ohms, noninductive) can be used in place of the power test adapter if available at this level of maintenance.

Set the 28-volt power supply for 28.0 volts.

b. Position the AN/PRC–64A controls as follows:

GAIN CONTROL: OFF
REC–SEND: SEND
LOADING: 1
IND SENS: OFF
Transmitter CHANNEL: desired channel
AM CW: CW
WHISPER: OUT

c. Depress internal key on the AN/PRC–64A and note indication on AN/URM–120, and the current indication on the 28-volt power supply.

d. Output indication on AN/URM–120 shall be at least 5.0 watts.

e. Compute transmitter efficiency from the following formula:

$$\text{EFFICIENCY} = \frac{\text{Power output}}{.28 \times \text{current}} \times 100\%$$

f. Efficiency shall be not less than 40 percent.

g. While holding Radio Set AN/PRC–64A internal key depressed, note and record indication on AN/USM–207.

h. Continue to hold internal key down and vary the 28-volt power supply from 20 to 31.5 vdc.

i. Indication on AN/USM–207 shall be within 0.08 percent of channel frequency at all input voltages between 20 and 31.5 vdc.

j. Set 28 vdc supply for 28.0 vdc and position AN/PRC–64A AM CW switch to AM.

k. Record indications on 28-volt supply current meter and AN/URM–120.

l. Compute efficiency from formula given in *e* above.

m. AM power output shall be at least 1.5 watt and efficiency shall be at least 20 percent.

8–10. Tests of Associated Circuitry

a. Connect the test equipment as shown in

figure 8–5 and position the Radio Set AN/PRC–64A controls as indicated in paragraph 8–5*b*, except set IND SENS to 3.

b. Depress Radio Set AN/PRC–64A internal telegraph key and observe ANT INDICATOR lamp which shall light.

c. Release internal telegraph key and observe ANT INDICATOR lamp which shall not light.

d. Repeat steps *b* and *c* above with IND SENS switch on 2 and 1. ANT INDICATOR lamp shall light when key is depressed and extinguish when key is released.

e. Turn IND SENS to OFF and depress internal telegraph key.

f. ANT INDICATOR lamp shall not light with internal key either depressed or released.

g. With 28 vdc supply set for 28 vdc, depress BAT TEST switch. Battery test indicator shall light.

h. Readjust the 28 vdc supply for 21.5 vdc and depress BAT. TEST switch. Battery test indicator shall light.

i. Readjust 28 vdc supply for 18.5 vdc and depress BAT. TEST switch. Battery test indicator shall *not* light.

j. Readjust 28 vdc supply for 28.0 vdc and while depressing the internal telegraph key, depress also the battery interlock switch. Current meter on 28 vdc supply shall indicate zero current.

8–11. Transmitter Amplitude Modulation and Audio Sensitivity and Sidetone Tests

a. Connect test equipment as shown in figure 8–6. Position Radio Set AN/PRC–64A controls as indicated in paragraph 8–8*b*, except set AM CW switch to AM.

b. Adjust output of AN/USM–205 for 1000 Hz at 8.0 millivolts (0 db reference).

c. Observe Oscilloscope AN/USM–281A which shall indicate a modulation of not less than 90 percent.

d. Place Radio Set AN/PRC–64A WHISPER switch in the IN position.

e. Readjust AN/USM–205 output for 90 percent modulation as observed on the AN/USM–281A.

f. Indication on AN/USM–205 meter shall be 10 db ± 3 db less than indication obtained in *b* above.

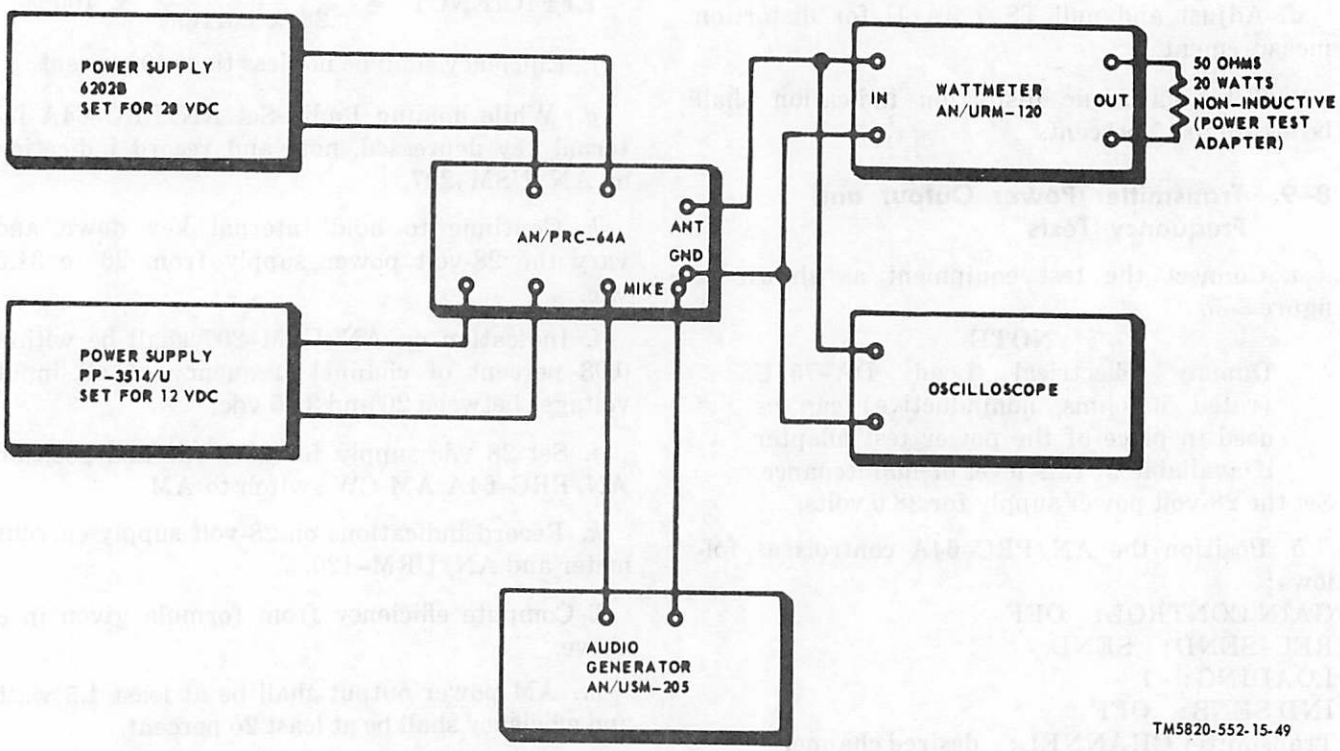


Figure 8–6. Transmitter amplitude modulation, audio sensitivity and sidetone tests, test setup.

g. Plug headset in the AN/PRC-64A PHONES jack and listen for sidetone which shall be present in earphone.

h. Position Radio Set AN/PRC-64A AM CW switch to CW and depress internal telegraph key. Sidetone shall be present in earphone.

8-12. Transmitter-Suprious Radiation and Backwave Suppression Tests

a. Connect test equipment as shown in figure 8-7.

b. While depressing the AN/PRC-64A internal key calibrate the AN/URM-85 for the radio set channel frequency using the indication on the AN/URM-85 as a zero db reference level.

c. Slowly rotate frequency control of AN/URM-85 tuning unit until a meter reading is obtained. Repeat calibration of AN/URM-85.

d. Note indication on AN/URM-85 meter in db and subtract from indication obtained in *b* above.

e. Indication obtained in *d* above shall be at least 35 db below operating frequency.

f. Repeat *c* and *d* above for other harmonics and other spurious radiation. Other harmonics shall be at least 35 db down and all other spurious radiation shall be at least 50 db down.

g. Repeat *b* above.

h. Release internal key and adjust AN/URM-85 for on-scale reading of its meter which shall be at least 60 db down from indication obtained in *g* above.

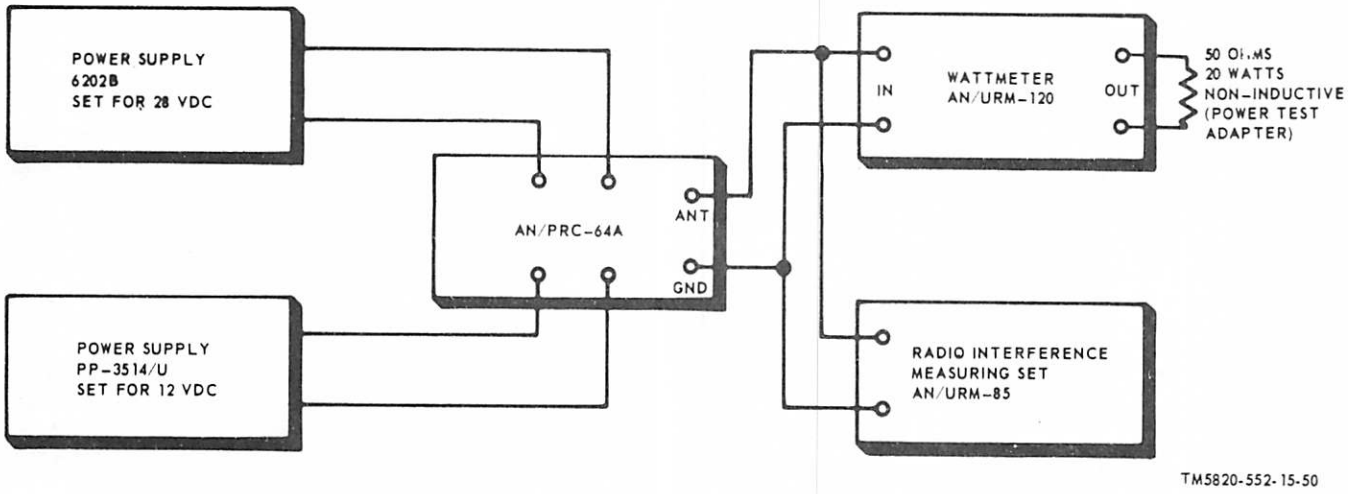


Figure 8-7. Transmitter spurious radiation and backwave suppression tests, test setup.

CHAPTER 9

SHIPMENT, LIMITED STORAGE AND DEMOLITION TO PREVENT ENEMY USE

Section I. SHIPMENT AND LIMITED STORAGE

9-1. Disassembly of Equipment

a. Remove battery.

b. Place headsets, microphone and spare parts in accessory compartment.

c. Place all components in carrying bag (fig. 2-1).

9-2. Repackaging

Repackaging of equipment for shipment or limited storage normally will be performed at a packaging facility or by a repackaging team. Should emergency packaging be required, select the materials from those listed in SB 38-100. Package the equipment in accordance with the original packaging, so far as possible, with the available materials.

Section II. DEMOLITION TO PREVENT ENEMY USE

9-3. Authority for Demolition

Demolition of the equipment will be accomplished only upon order of the commander. Use the destruction procedures outlined in paragraph 8-4 to prevent further use of the equipment.

9-4. Methods of Destruction

Use any of the following methods to destroy the equipment:

a. Smash. Smash the controls, switches, headsets, microphone, and electronic assemblies; use sledges, axes, handaxes, pickaxes, hammers, or crowbars.

b. Cut. Cut headset cords and carrying bag; use axes, handaxes, or machetes.

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

d. Bend. Bend the cases.

WARNING

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

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

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

9-5. Priorities for Destruction

When lack of time prevents complete destruction of the equipment, destroy equipment in the following order of priority:

a. Transmitter section, especially crystals.
b. Receiver section, especially crystals.
c. Modulator section.
d. Antenna components.
e. Battery.
f. Antenna components.
g. Headsets, microphone and spare parts.
h. Technical manuals.

APPENDIX A
REFERENCES

Following is a list of applicable references available to the operator and repairman of Radio Set AN/PRC-64A:

DA Pam 310-4	Index of Technical Manuals, Technical Bulletins, Supply Manuals (Types 7, 8 and 9), Supply Bulletins, and Lubrication Orders.
DA Pam 310-7	US Army Equipment Index of Modification Work Orders.
SB 38-100	Preservation, Packaging, and Packing Materials, Supplies, and Equipment Used by the Army.
TB 43-0118	Field Instructions for Painting and Preserving Electronics Command Equipment Including Camouflage Pattern Painting of Electrical Equipment Shelters.
TM 11-6625-203-12	Operation and Organizational Maintenance Manual: Multimeter AN/URM-105.
TM 38-750	The Army Maintenance Management System (TAMMS).
TM 11-6625-573-14	Signal Generator AN/GRM-50.
TM 11-6625-617-12	Power Supply PP-3514/U.
TM 11-6625-446-15	Wattmeter AN/URM-120.
TM 11-6625-700-10	Digital Readout Electronic Counter, AN/USM-207.
TM 11-6625-320-12	Voltmeter, Meter ME-30A/U.
TM 11-6625-366-15	Multimeter TS-352/U.
TM 11-5017	Audio Power Meter TS-585/U.
TM 11-6625-665-15	Signal Generator AN/USM-205.
TM 750-244-2	Procedures for Destruction of Electronics Materiel to Prevent Enemy Use (Electronics Command).
TM 11-5820-552-24P	Organizational, Direct Support, and General Support Maintenance Repair Parts and Special Tools Lists (Including Depot Maintenance Repair Parts and Special Tools List) for Radio Set AN/PRC-64A (NSN 5820-00-143-4095).

APPENDIX B
MAINTENANCE ALLOCATION

Section I. INTRODUCTION

B-1. General.

This appendix provides a summary of the maintenance operations for AN/PRC-64. 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 Function

Maintenance functions will be limited to and defined as follows:

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

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

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

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

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

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

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

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

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

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

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

B-3. Column Entries

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

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

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

d. Column 4, Maintenance Category. Column 4 specifies, by the listing of a "work time" figure in the appropriate subcolumn(s), the lowest level of maintenance authorized to perform the function listed in column 3. This figure represents the active time required to perform that maintenance function at the indicated category of maintenance. If the number or complexity of the tasks within the listed maintenance function vary at different maintenance categories, appropriate "work time" figures will be shown for each category. The

number of task-hours specified by the "work time" figure represents the average time required to restore an item (assembly, subassembly, component, module, end item or system) to a serviceable condition under typical field operating conditions. This time includes preparation time, troubleshooting time, and quality assurance/quality control time in addition to the time required to perform the specific tasks identified for the maintenance functions authorized in the maintenance allocation chart. Subcolumns of column 4 are as follows:

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

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

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

B-4. Tool and Test Equipment Requirements (Sect. III).

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

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

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

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

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

B-5. Remarks (Sect. IV).

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

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

SECTION II MAINTENANCE ALLOCATION CHART
FOR
RADIO SET AN/PRC-64A

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY					(5) TOOLS AND EQPT.	(6) REMARKS
			C	O	F	H	D		
00	RADIO SET AN/PRC-64A	Inspect	0.1						
		Service	0.1						
		Service		0.5					
		Test	0.2						A
		Test		0.3				1	B
		Test				0.75		3 thru 7 9 thru 14	C
		Test					2.0	3 thru 17	D
		Align				1.0		3 thru 8 10,12,13, 14	
		Repair		0.3				2	E
		Repair				1.0		18,19	F
		Overhaul					8.0	18,19	

SECTION III TOOL AND TEST EQUIPMENT REQUIREMENTS
FOR
RADIO SET AN/PRC-64A

TOOL OR TEST EQUIPMENT REF CODE	MAINTENANCE CATEGORY	NOMENCLATURE	NATIONAL/NATO STOCK NUMBER	TOOL NUMBER
1	O	MULTIMETER AN/URM-105C	6625-00-999-6282	
2	O	TOOL KIT, ELECTRONIC EQUIPMENT TK-101/G	5180-00-064-5178	
3	H,D	SIGNAL GENERATOR AN/GRM-50C	6625-00-003-3238	
4	H,D	POWER SUPPLY PP-3514/U	6625-00-445-6933	
5	H,D	POWER SUPPLY PP-3940A/G	6130-00-404-1727	
6	H,D	TEST SET, RF, POWER AN/URM-120	6625-00-813-8430	
7	H,D	DIGITAL READOUT ELECTRONIC COUNTER AN/USM-207A	6625-00-044-3228	
8	H,D	VOLTMETER ME-30A/U	6625-00-643-1670	
9	H,D	MULTIMETER TS-352B/U	6625-00-553-0142	
10	H,D	OUTPUT METER TS-585A,B,C/U	6625-00-244-0501	
11	H,D	SIGNAL GENERATOR AN/USM-205	6625-00-788-9672	
12	H,D	CHASSIS EXTENSION ADAPTER*		
13	H,D	POWER TEST ADAPTER*		
14	H,D	SPECIAL TEST CABLES*		
15	D	SPECTRUM ANALYZER TS-723A/U	6625-00-668-9418	
16	D	OSCILLOSCOPE AN/USM-281A	6625-00-228-2201	
17	D	RADIO INTERFERENCE MEASURING SET AN/URM-85	6625-00-776-0595	
18	H,D	TOOL KIT, ELECTRONIC EQUIPMENT TK-100/G	5180-00-605-0079	
19	H,D	TOOL KIT, ELECTRONIC EQUIPMENT TK-105/G	5180-00-610-8177	

*SEE FIGURE 7-1 FOR DESCRIPTION

SECTION IV. REMARKS

REFERENCE CODE	REMARKS
A	BATTERY AND OPERATIONAL TEST
B	CONTINUITY TEST OF ANTENNA AND INDICATOR LAMPS
C	FULL TEST
D	DEPOT OVERHAUL STANDARDS
E	BY REPLACEMENT OF BATTERY, KNOBS, LAMPS, ANTENNA MICROPHONE, HEADSET AND CARRYING CASE
F	FULL REPAIR AND REPLACEMENT OF CRYSTALS

INDEX

By Order of the Secretary of the Army:

W. C. WESTMORELAND,
General, United States Army,
Chief of Staff.

Official:

KENNETH G. WICKHAM,
Major General, United States Army,
The Adjutant General.

Distribution:

To be distributed in accordance with DA Form 12-51 (qty rqr Block #345), Operator requirements for AN/PRC-64 radio set.

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL MANUALS

SOMETHING WRONG WITH THIS MANUAL?

THEN. . .JOT DOWN THE DOPE ABOUT IT ON THIS FORM, TEAR IT OUT, FOLD IT AND DROP IT IN THE MAIL!

FROM: (YOUR UNIT'S COMPLETE ADDRESS)
Commander
Stateside Army Depot
ATTN: AMSTA-US
Stateside, N.J. 07703

DATE 10 July 1975

PUBLICATION NUMBER	DATE	TITLE
TM 11-5840-340-12	23 Jan 74	Radar Set AN/PPC-76

BE EXACT. . .PIN-POINT WHERE IT IS

IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:

PAGE NO.	PARAGRAPH	FIGURE NO.	TABLE NO.	
2-25	2-28			Recommend that the installation antenna alignment procedure be changed throughout to specify a 2° IFF antenna lag rather than 1°. REASON: Experience has shown that with only a 1° lag, the antenna servo system is too sensitive to wind gusting in excess of 25 knots, and has a tendency to rapidly accelerate and decelerate as it hunts, causing strain to the drive train. Hunting is minimized by adjusting the lag to 2° without degradation of operation.
3-10	3-3		3-1	Item 5, Function column. Change "2 db" to "3db." REASON: The adjustment procedure for the TRANS POWER FAULT indicator calls for a 3 db (500 watts) adjustment to light the TRANS POWER FAULT indicator.
5-6	5-8			Add new step f.1 to read, "Replace cover plate removed in step e.1, above." REASON: To replace the cover plate.
		F03		Zone C 3. On J1-2, change "+24 VDC to "+5 VDC." REASON: This is the output line of the 5 VDC power supply. + 24 VDC is the input voltage.

TYPED NAME, GRADE OR TITLE, AND TELEPHONE NUMBER	SIGN HERE:
SSG I. M. DeSpiritof 999-1776	SSG I. M. DeSpiritof

DA FORM 1 AUG 74 2028-2

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DATE

PUBLICATION NUMBER	DATE	
TM 11-5820-552-15	16 Nov 70	

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PAGE NO.	PARAGRAPH	FIGURE NO.	TABLE NO.

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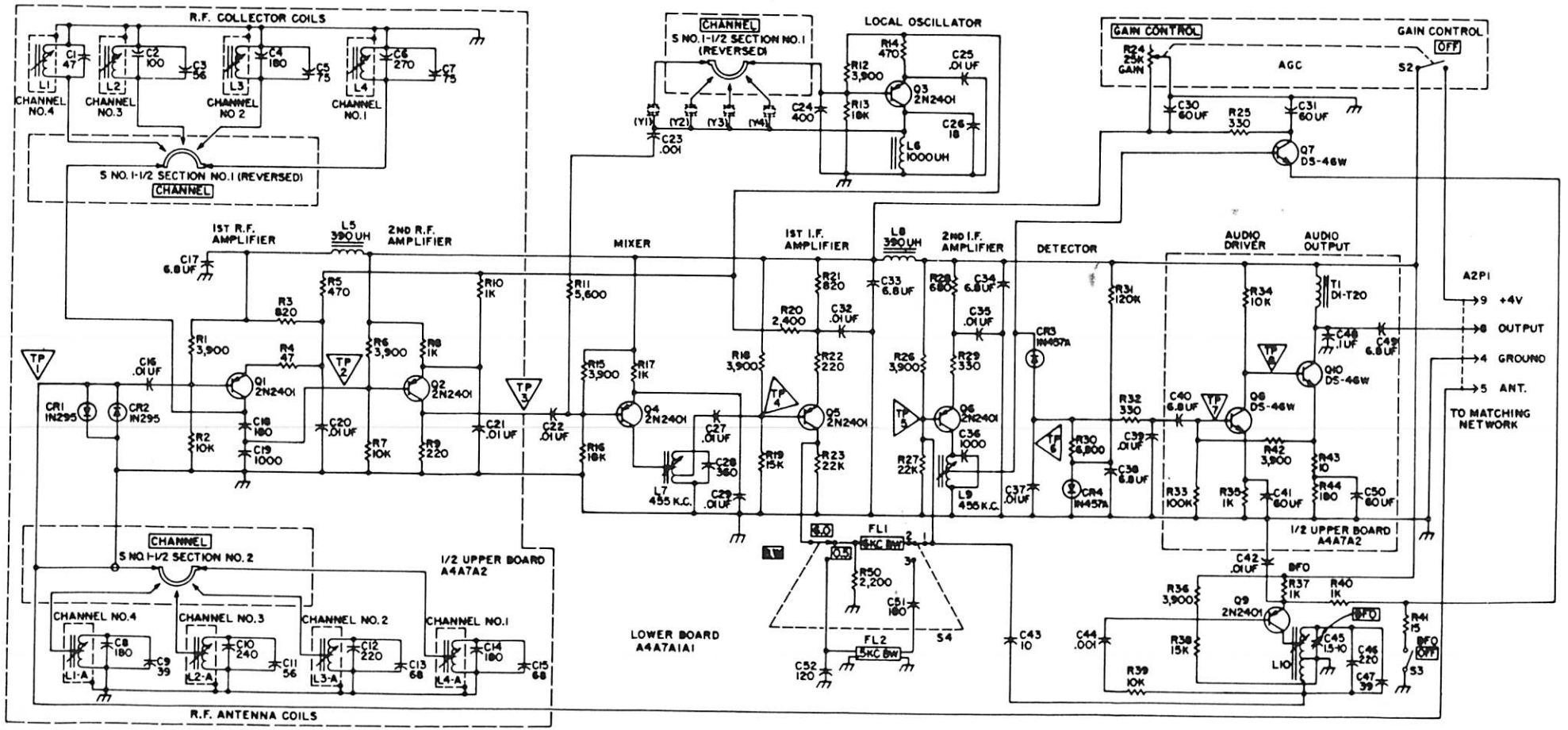
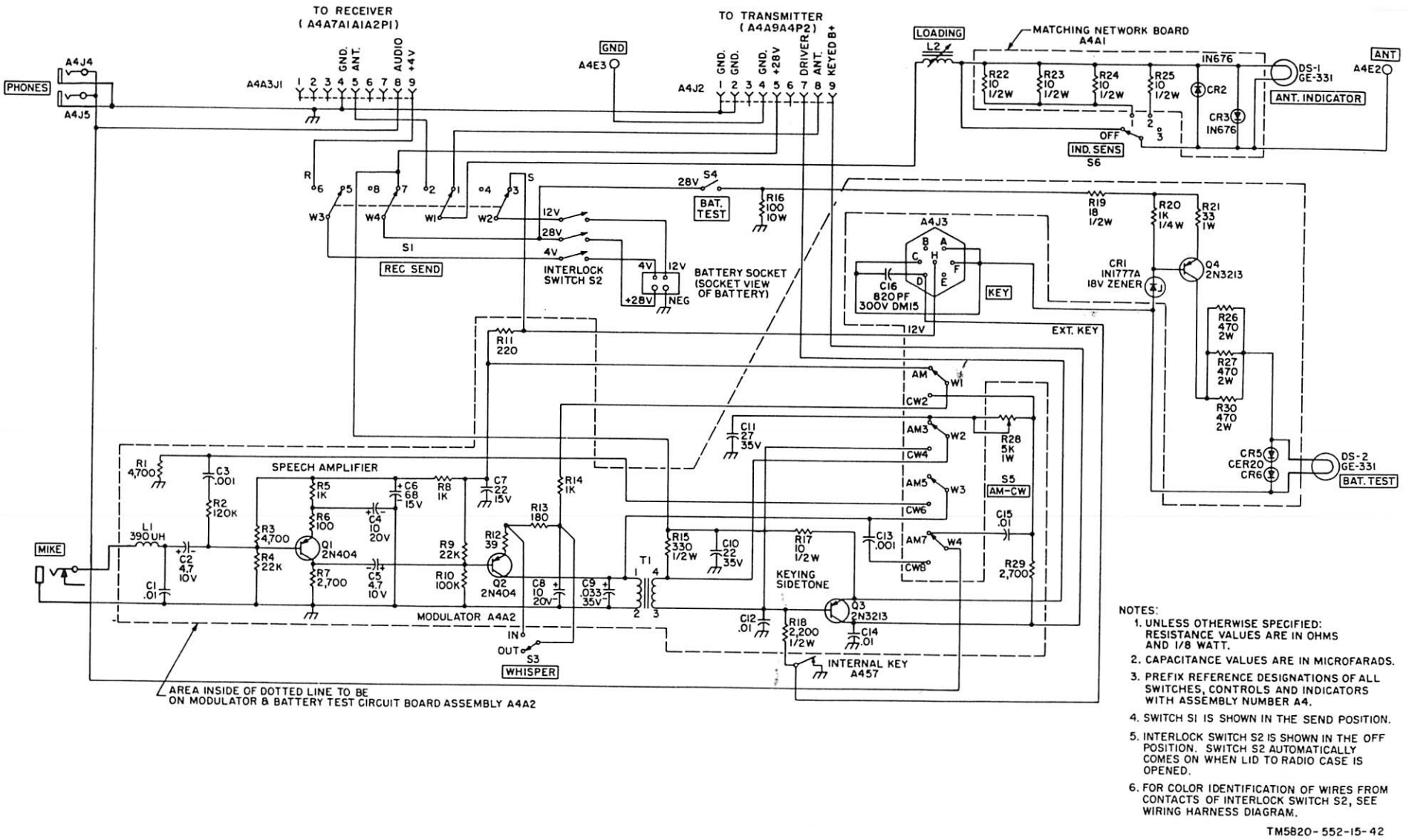


NOTES:
1. UNLESS OTHERWISE SPECIFIED: RESISTANCE VALUES ARE IN OHMS AND 1/8 WATT.
2. CAPACITANCE VALUES ARE IN MICROFARADS.
3. PREFIX REFERENCE DESIGNATIONS OF ALL SWITCH, CONTROLS AND INDICATORS WITH ASSEMBLY NUMBER A4.

TM5820-552-15-40

Figure 7–25. Schematic diagram, receiver assembly A4A7, Radio Set AN/PRC-64A.



NOTES:

1. UNLESS OTHERWISE SPECIFIED: RESISTANCE VALUES ARE IN OHMS AND 1/8 WATT.
2. CAPACITANCE VALUES ARE IN MICROFARADS.
3. PREFIX REFERENCE DESIGNATIONS OF ALL SWITCHES, CONTROLS AND INDICATORS WITH ASSEMBLY NUMBER A4.
4. SWITCH S1 IS SHOWN IN THE SEND POSITION.
5. INTERLOCK SWITCH S2 IS SHOWN IN THE OFF POSITION. SWITCH S2 AUTOMATICALLY COMES ON WHEN LID TO RADIO CASE IS OPENED.
6. FOR COLOR IDENTIFICATION OF WIRES FROM CONTACTS OF INTERLOCK SWITCH S2, SEE WIRING HARNESS DIAGRAM.

TM5820-552-15-42

Figure 7-27. Schematic diagram, top plate assembly A4, Radio Set AN/PRC-64A.