

TM 11-5985-284-15

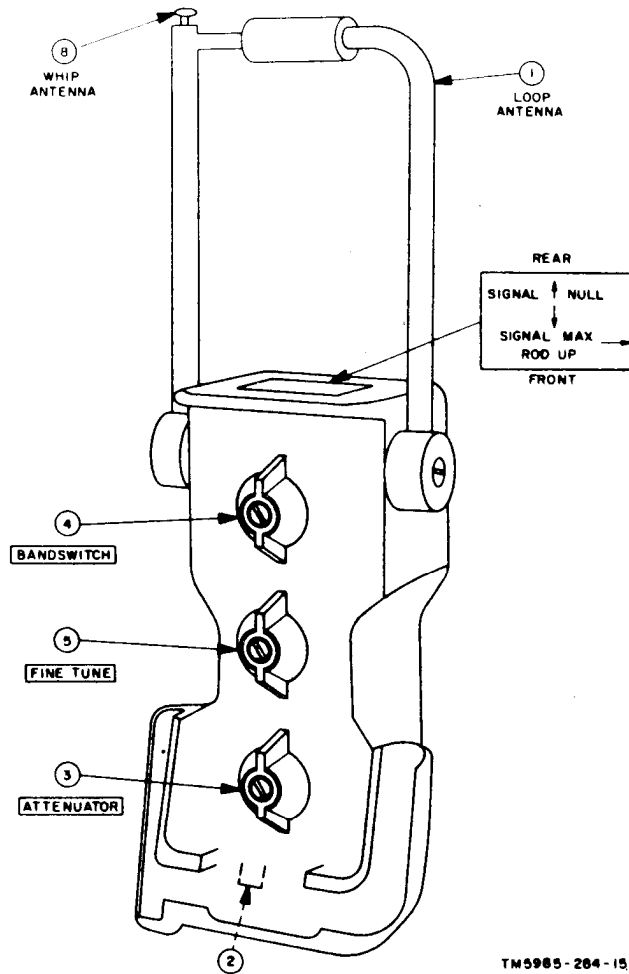
DEPARTMENT OF THE ARMY TECHNICAL MANUAL

OPERATOR, ORGANIZATIONAL,
DS, GS, AND DEPOT MAINTENANCE MANUAL
INCLUDING REPAIR PARTS
SPECIAL TOOLS LISTS
ANTENNA, LOOP AT-784/PRC

(NSN 5820-00-086-7651)

This copy is a reprint which includes current pages from Changes 1 through 5. Title was changed by Change 5.

HEADQUARTERS, DEPARTMENT OF THE ARMY
FEBRUARY 1967



Antenna AT-1082/PRC.

CONDENSED OPERATING INSTRUCTIONS

Caution: Use for reception only. Do not transmit. Whenever loop antenna is not in use, keep ATTENUATOR switch set in 0 position. Choose operating location free from obstructions.

To Operate

a. From Modulated Carrier Signal Source. The numbers of steps 1 through 5 and 8 below are the same as those on the illustration.

- (1) Swing loop antenna up from the case. Do not extend the whip.
- (2) Connect antenna cable from connector J1 (of AT-1082/PRC) to the antenna coaxial connector of the receiver. Set receiver volume control to maximum and squelch off.
- (3) Set the ATTENUATOR switch to position 0.
- (4) Set the BANDSWITCH to the desired frequency band.
- (5) Adjust FINE TUNE control to desired operating frequency within selected band.
- (6) Hold loop antenna at eye level and rotate until

- signal is received. Adjust FINE TUNE (5) for maximum response. If response is too strong, advance ATTENUATOR (3) to higher number.
- (7) Rotating the loop will obtain two positions, 180° apart corresponding to SIGNAL NULL arrows, giving maximum signal response.
- (8) Extend the whip and note signal response in one position. Rotate the antenna one-half turn (180°) and note response in second position.
- (9) Orient the antenna to obtain stronger signal response. The SIGNAL MAX arrow (on the case) now points toward the transmitter.
- (10) Retract the whip. Rotate the antenna one-quarter turn (90°) to SIGNAL NULL position for sharp and accurate bearing indication.

b. From Unmodulated Carrier Signal Source. Operation procedure for direction finding from this source is the same as described above. However, the signal response sought in steps 6 through 9 is maximum quieting action of carrier over noise. NULL is defined as maximum noise obtained.

Operator's, Organizational, Direct Support, General Support
 and Depot Maintenance Manual

**ANTENNA, LOOP AT-784/PRC
 (NSN 5820-00-086-7651)**

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*This manual supersedes TM 11-5820-496-20P, 13 March 1964, and TM 11-5820-496-35P, 24 July 1963.

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CHAPTER 1

INTRODUCTION

Section I. GENERAL

1-1. Scope

a. This manual describes the components of Antenna, Loop AT-784/PRC (fig. 1-1), and covers their use, operator's maintenance, organizational maintenance, and basic functioning. It also contains the repair functions for this equipment which are to be accomplished by direct support, general support (DS and GS) and depot maintenance.

b. Throughout this manual, the term *sense whip antenna* refers to the telescoping portion of Antenna AT-1082/PRC and *loop* refers to the loop antenna in which the telescoping antenna is mounted.

1-2. Indexes of Publications

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

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

1-3. Maintenance Forms, Records, and Reports

a. *Reports of Maintenance and Unsatisfactory Equipment*. Department of the Army forms and procedures used for equipment maintenance will be those prescribed by TM 38-750, The Army Maintenance Management System (TAMMS).

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 4610.33B/AFR 75-18/MCO P4610.19C and DLAR 4500.15.

1-3.1. Reporting Errors and Recommending Improvements

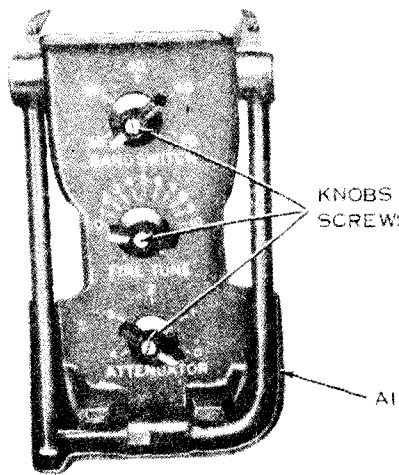
You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter or DA Form 2028 (Recommended Changes to Publications and Blank Forms) direct to: Commander, US Army Communications and Electronics Materiel Readiness Command, ATTN: DRSEL-ME-MQ, Fort Monmouth, NJ 07703.

1-3.2 Reporting Equipment Improvement Recommendations (EIR)

If your Antenna, Loop AT-784/PRC needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design. Tell us why a procedure is hard to perform. Put it on an SF 368 (Quality Deficiency Report). Mail it to Commander, US Army Communications and Electronics Materiel Readiness Command, ATTN: DRSEL-ME-MQ, Fort Monmouth, NJ 07703. We'll send you a reply.

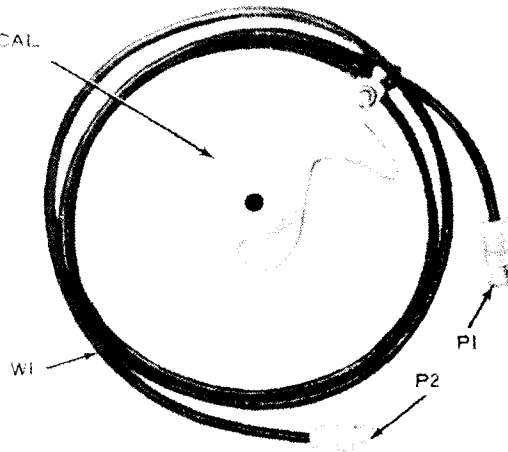
1-3.3. Destruction of Army Electronics Materiel

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



ANTENNA AT-1082 PRC
(A1)

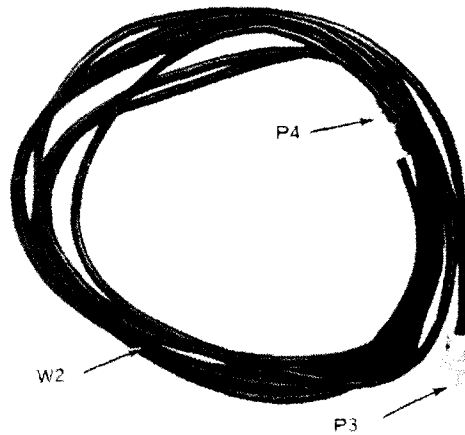
CAP ELECTRICAL
CW-922 GRC
(A5)



CABLE ASSEMBLY RADIO
FREQUENCY CG-3344 PRC (5FT)
(A3)



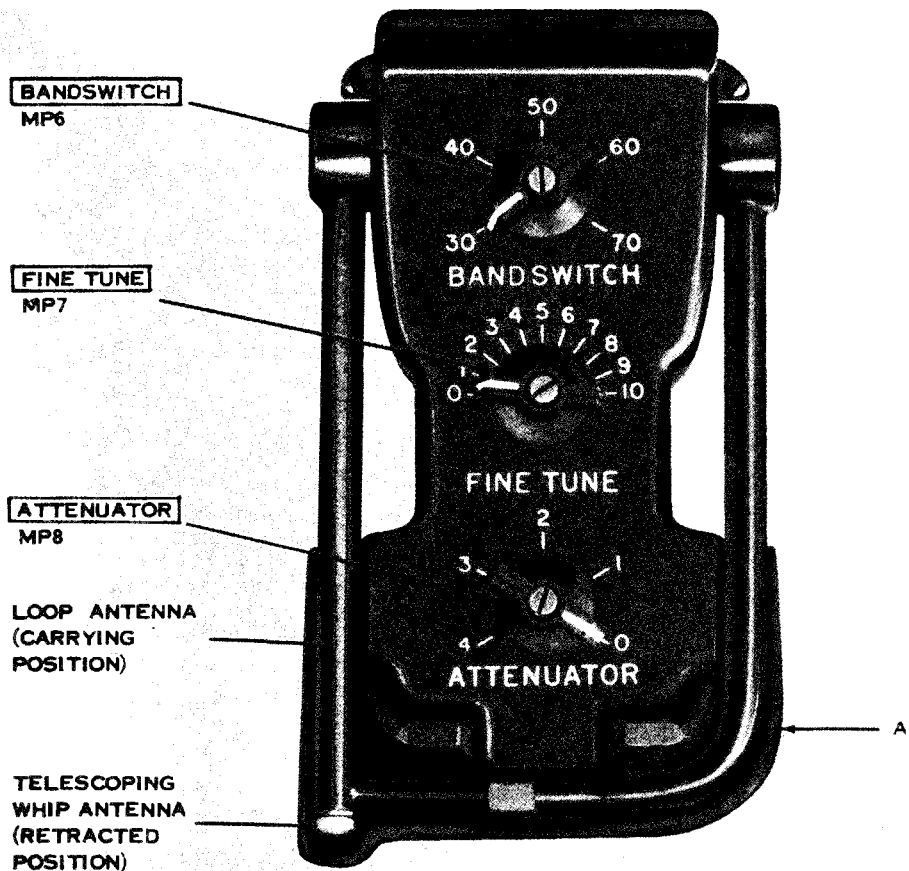
BAG, COTTON DUCK
CW-445 PRC
(A2)



CABLE ASSEMBLY, RADIO
FREQUENCY CG-2840A U (12FT)
(A4)

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Figure 1-1. Components comprising Antenna, Loop AT-784/PRC.



EL 5985 284 15 - TM 6

Figure 1-2. Antenna AT-1082/PRC.

Section II. DESCRIPTION AND DATA

1-4. Purpose and Use

u. Purpose. Antenna, Loop AT-784/PRC, when used in conjunction with Radio Set AN/PRC-25, AN/VRG-12, or their equivalents, comprises a homing device that enables the operator to find the direction of a transmitted signal within the frequency range of 30 to 76 MegaHertz (MHz).

CAUTION

Use the AT-784/PRC for reception only. Do not transmit. Whenever the loop antenna is not in use, keep the ATTENUATOR switch set to 0.

The unshielded loop antenna of Antenna AT-1082/PRC is used to pick up a homing signal, and its extendable sense whip antenna (fig. 1-2) is used to determine the direction of the transmitted signal. The AT-1082/PRC is not provided with an azimuth indicator, since highly accurate bearings are not generally required for

homing purposes. A pocket compass can be used to provide approximate azimuth readings by sighting in the direction of the indicated bearing.

1-5. Technical Characteristics

Frequency range	30 to 76 MHz covered in five bands.
Frequency bands	(1) 30-40 MHz. (2) 40-50 MHz. (3) 50-60 MHz. (4) 60-70 MHz. (5) 70-76 MHz.
Fine tuning range	0-10 MHz covered in 1-MHz steps.
Signal attenuation	0-46 dB covered in five step: 0, 10, 20, 30, and 40 dB.

1-6. Components of Antenna, Loop AT-784/PRC

(Fig. 1-1)

The components of Antenna, Loop AT-784/PRV, are listed in the following table:

Quantity	Item	Height (in.)	Depth (in.)	Width (in.)	Unit weight (lb)
1	Antenna AT-1082/PRC	**7½	2¾	4¼	2½
1	Bag, Cotton Duck CW-445/PRC	8	3½	6¼	0.9
1	Cable Assembly, Radio Frequency CG-3344/PRC (5-ft).				
1	Cable Assembly, Radio Frequency CG-2840A/U (12 ft).				

*Refers to the height with the sense whip antenna retracted and the loop antenna turned down.

1-6.1. items Comprising an Operable Antenna, Loop AT/784/PRC

NSN	Quantity	Nomenclature, part No., and mfr code	Fig. No.
		NOTE The part number is followed by the applicable 5-digit Federal supply code for manufacturers (FSCM) identified in SB 708-42 and used to identify manufacturer, distributor, or Government agency, etc.	
5820-00-086-7651	1	Antenna, Loop AT-784/PRC which includes:	1-1
5985-00-889-3921	1	Antenna AT-1082/PRC: MIL-A-55138, 80063	1-1
5995-00-933-9862	1	Cable Assembly, RF, CG-3344/PRC: SM-D-5088884, 80063	1-1
5985-00-937-1630	1	Cap, Electrical, CW-922/GRC: SC-DL-508885, 80063	1-1
5995-00-933-8961	1	Cable Assembly RF, CG-2840 A/U: SM-D-508886, 80063	1-1

1-7. Description of Antenna AT-1082/PRC (fig. 1-2)

Antenna AT-1082/PRC is a compact, portable unit that is housed in a cast aluminum case. A loop antenna is mounted on top of the case and it has an expendable sense whip antenna within its left side. The case is shaped to be easily hand held and serves to protect the antenna assembly when it is folded down and to protect its panel controls from accidental damage by dropping. The grooved rear cover of this case allows access to the components and provides a watertight inclosure. An instruction label that contains condensed operating instructions (fig. 2-3) is secured to the cover. The controls of the AT-1082/PRC include a bandswitch, a fine tuning control, and an attenuation control switch.

1-8. Description of Associated Components

The minor components of Antenna, Loop AT-784/PRC, which are associated with Antenna AT-1082/PRC, are shown in figure 1-1 and are described below:

a. Cable Assembly, Radio Frequency CG-3344/PRC (5-Ft). This is a 5-foot cable in-

cluding Cap, Electrical CW-922/GRC (shield cap), for the large antenna post of the associated radio receiver, attached by cord. It is used to connect AT-1082/PRC to the associated receiving set.

b. Cable Assembly, Radio Frequency CG-2840 A/U (12-Ft). This is a 12-foot cable that is provided for extending the cable connection of the AT-1082/PRC to a receiving set whenever required.

c. Bag, Cotton Duck CW-445/PRC. This bag is for carrying and storing Antenna AT-1082/PRC, a shield cap for its output connector, and the two associated cables. Moisture and fungus resistant cotton duck material is used for the construction of this bag.

1-9. Additional Equipment Required

Radio Set AN/PRC-25, AN/VRC-12, or equivalent, is not supplied with Antenna, Loop AT-784/PRC; however, one of similar type is required for use of this antenna. *For example:* Radio Set AN/PRC-25, which is a manpack receiver-transmitter, is capable of receiving input signals over the frequency range of 30 to 76 MHz.

CHAPTER 2

INSTALLATION AND OPERATION INSTRUCTIONS

Section I. SERVICE UPON RECEIPT OF ANTENNA LOOP AT-784/PRC

2-1. Unpacking

a. Packaging Data. When packed for shipment, the components comprising Antenna, Loop AT-784/PRC, are placed in a corrugated cardboard carton. A typical shipping carton and its contents is shown in figure 2-1. The dimensions of the carton are 10½ by 6½ by 5 inches.

b. Removing Contents. To unpack, proceed as follows: Open the carton, lift out Bag, Cotton Duck CW-445/PRC, remove its contents, and check the components (para 2-2, and para 1-6.1).

NOTE

Save the original packing carton. It can be used again when the equipment is repacked for storage or shipment.

2-2. Checking Unpacked Equipment

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

b. See that the equipment is complete as listed on the packing slip, or paragraph 1-6.1. Report all discrepancies in accordance with AR 735-11-2. Shortage of a minor assembly or part that does not affect proper functioning of the AT-1082/PRC should not prevent use of the equipment.

2-3. Installation

To install Antenna AT-1082/PRC, follow the procedures in a through e below.

a. Remove the AT-1082/PRC from the CW-445/PRC (carrying bag).

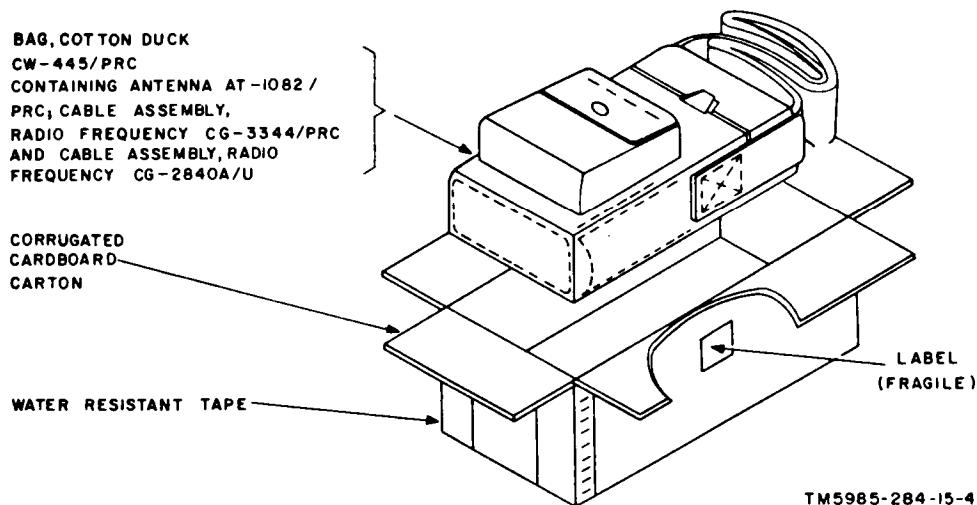


Figure 2-1. Packaging of Antenna, Loop AT-784/PRC.

b. Place the loop antenna into operating position as shown in figure 2-3.

c. Connect connector J1 of the AT-1082/PRC to the antenna coaxial connector of the radio set with which it is to be used by the CG-3344/PRC cable. The 12-foot cable (CG-2840A/U) may be added to the CG-3344/PRC to increase the interconnection cable length, if required.

d. Remove all other antennas from the radio.

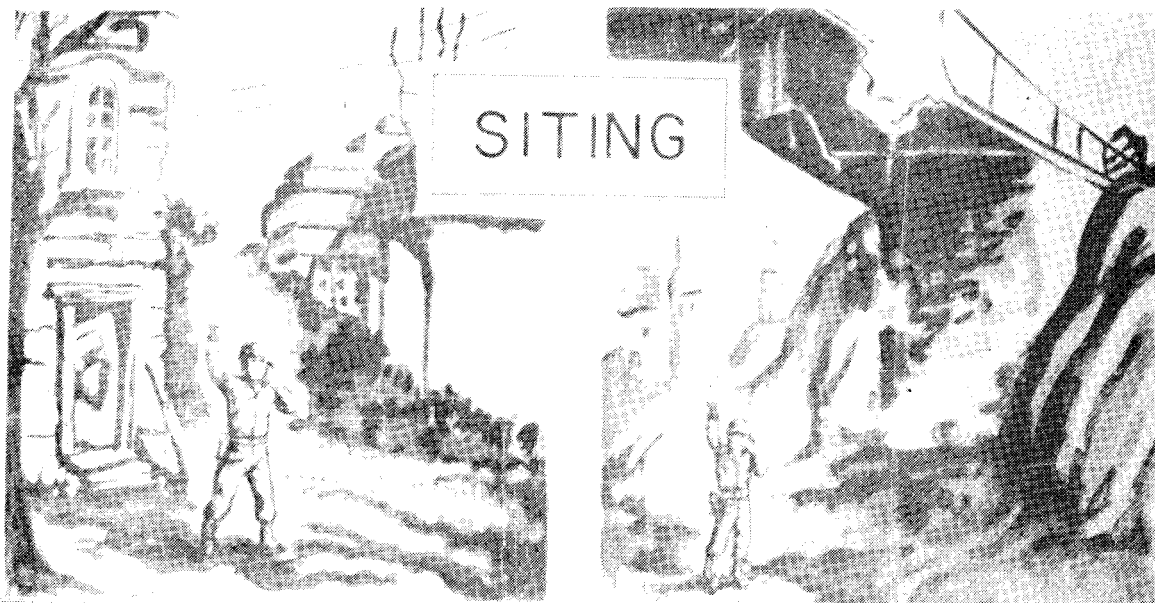
e. The shield cap attached to the CG-3344/PRC (fig. 1-1) is provided for use with Receiver-Transmitters, Radio RT-505/PRC-25 (part of Radio Sets AN/PRC-25 and AN/VRC-53) and RT-841/PRC-77 (part of Radio Set AN/PRC-77). On these receiver-transmitters, press the shield cap down as far as it will go over the whip antenna base. The inside top of the shield cap should contact the top of the whip antenna base on the radio and

ground it to the radio set chassis. When the radio set whip antenna base is not grounded, it interferes with homing signals.

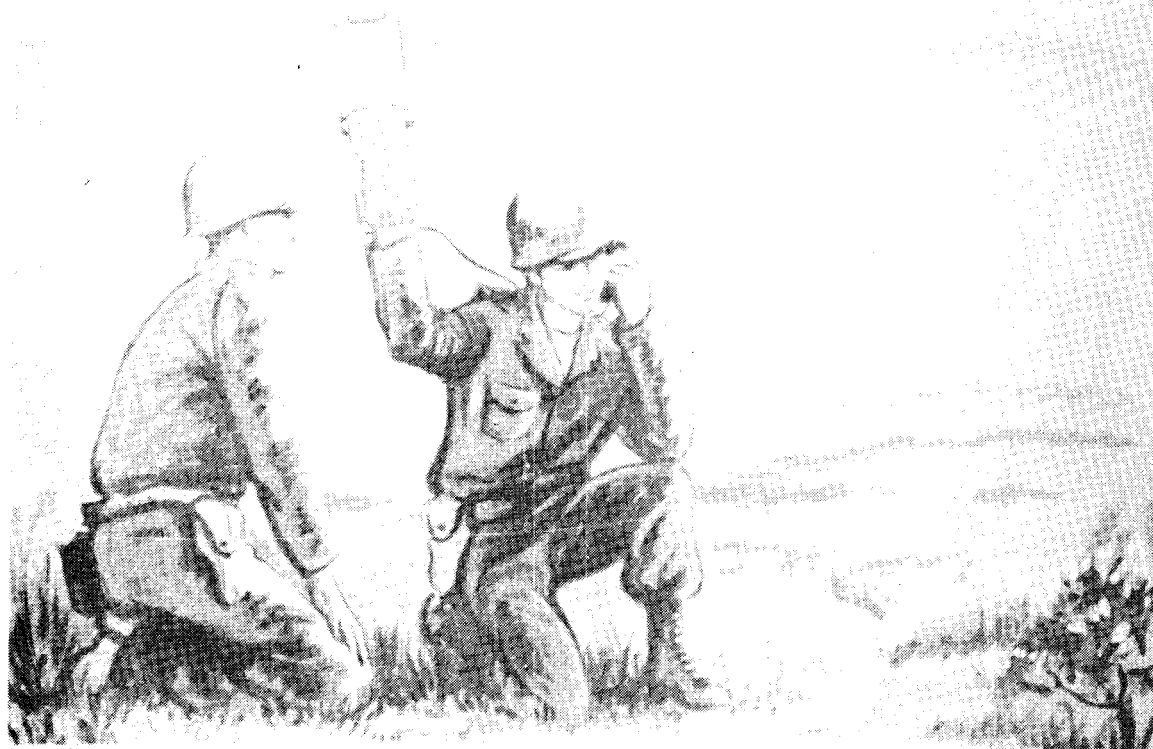
2-4. Siting

(fig. 2-2)

The best performance of Antenna AT-1082/PRC is obtained when it is used over an unobstructed line-of-sight path with a compatible radio set. For this reason, the AT-1082/PRC should be operated away from obstructions such as large buildings, bridges, steel structures, and hills. These objects will block or deflect the desired signal, thereby making homing difficult or impossible. Also, this equipment should not be operated near high-power or telephone lines. The best sites for desired directional looping are on hilltops or over open, flat terrain. Figure 2-2 illustrates typical good and poor locations for AT-1082/PRC operation.



BAD NEAR BUILDINGS, TREES, HIGH TENSION LINES, STEEL CONSTRUCTION



GOOD HILLS OR RISES - OPEN COUNTRY

EL 5985 284-15 TM-5

Figure 2-2. Using AT-1082/PRC in good and bad operating areas.

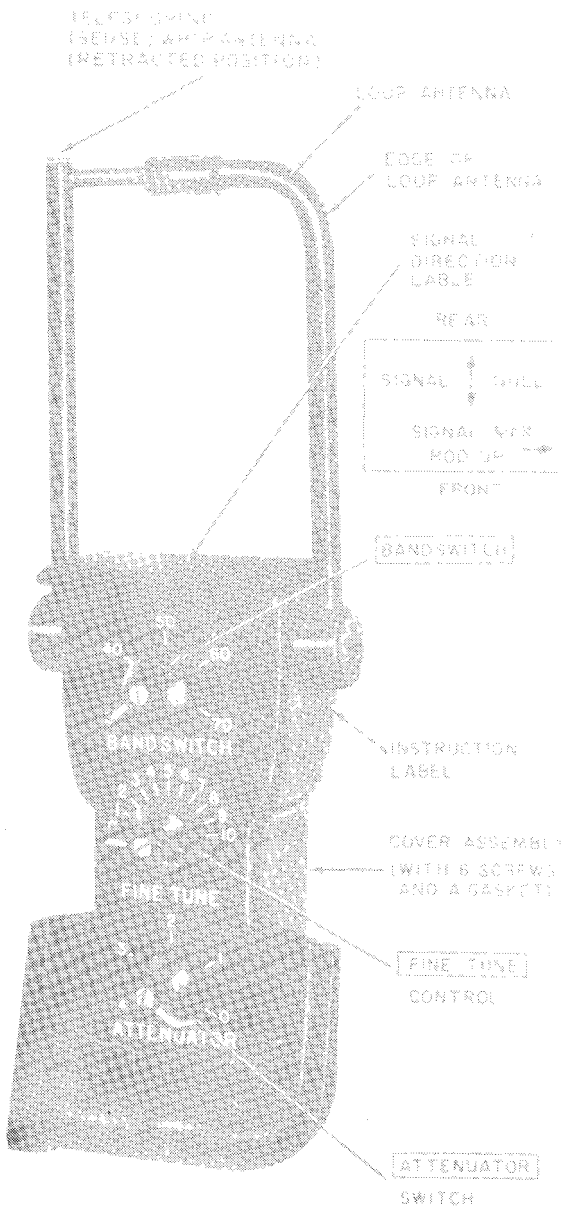
Section II. ANTENNA CONTROLS

2-5. Controls and Their Uses

All operating controls of Antenna AT-1082/PRC are listed in paragraph 2-6 and are shown in figure 2-3. Care should be taken not to force controls since damage to switch contacts may result.

2-6. Controls and Antennas

Control or antenna	Function																						
BANDSWITCH	Controls one of five available bands of frequencies for operation: <table border="0"> <tr> <td>Position:</td> <td>Frequency band (MHz)</td> </tr> <tr> <td>30.....</td> <td>30-40</td> </tr> <tr> <td>40.....</td> <td>40-50</td> </tr> <tr> <td>50.....</td> <td>50-60</td> </tr> <tr> <td>60.....</td> <td>60-70</td> </tr> <tr> <td>70.....</td> <td>70-76</td> </tr> </table>	Position:	Frequency band (MHz)	30.....	30-40	40.....	40-50	50.....	50-60	60.....	60-70	70.....	70-76										
Position:	Frequency band (MHz)																						
30.....	30-40																						
40.....	40-50																						
50.....	50-60																						
60.....	60-70																						
70.....	70-76																						
FINE TUNE	Controls the operating frequency within the frequency band selected by the BANDSWITCH: <table border="0"> <tr> <td>Position:</td> <td>Frequency (MHz)</td> </tr> <tr> <td>1.....</td> <td>31, 41, 51, etc.</td> </tr> <tr> <td>2.....</td> <td>32, 42, 52, etc.</td> </tr> <tr> <td>3.....</td> <td>33, 43, 53, etc.</td> </tr> <tr> <td>4.....</td> <td>34, 44, 54, etc.</td> </tr> <tr> <td>5.....</td> <td>35, 45, 55, etc.</td> </tr> <tr> <td>6.....</td> <td>36, 46, 56, etc.</td> </tr> <tr> <td>7.....</td> <td>37, 47, 57, etc.</td> </tr> <tr> <td>8.....</td> <td>38, 48, 58, etc.</td> </tr> <tr> <td>9.....</td> <td>39, 49, 59, etc.</td> </tr> <tr> <td>10.....</td> <td>40, 50, 60, etc.</td> </tr> </table>	Position:	Frequency (MHz)	1.....	31, 41, 51, etc.	2.....	32, 42, 52, etc.	3.....	33, 43, 53, etc.	4.....	34, 44, 54, etc.	5.....	35, 45, 55, etc.	6.....	36, 46, 56, etc.	7.....	37, 47, 57, etc.	8.....	38, 48, 58, etc.	9.....	39, 49, 59, etc.	10.....	40, 50, 60, etc.
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1.....	31, 41, 51, etc.																						
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7.....	37, 47, 57, etc.																						
8.....	38, 48, 58, etc.																						
9.....	39, 49, 59, etc.																						
10.....	40, 50, 60, etc.																						
ATTENUATOR	Varies strength of the signal passing through the AT-1082/PRC to the radio set: <table border="0"> <tr> <td>Position:</td> <td>Signal loss (approx db)</td> </tr> <tr> <td>0.....</td> <td>0</td> </tr> <tr> <td>1.....</td> <td>10</td> </tr> <tr> <td>2.....</td> <td>20</td> </tr> <tr> <td>3.....</td> <td>30</td> </tr> <tr> <td>4.....</td> <td>40</td> </tr> </table>	Position:	Signal loss (approx db)	0.....	0	1.....	10	2.....	20	3.....	30	4.....	40										
Position:	Signal loss (approx db)																						
0.....	0																						
1.....	10																						
2.....	20																						
3.....	30																						
4.....	40																						



NOTE:

[] INDICATES EQUIPMENT MARKING

Figure 2-3. Antenna AT-1082/PRC, controls and antennas.

Control or antenna	Function
Loop antenna - - - - -	When extended, receives radio waves for transmission through the AT-1082/PRC to the associated receiver. When situated broadside to the transmitted signal, the signal is attenuated (null condition); conversely, when situated so that the edges of the loop face the transmitted signal, the signal is not attenuated.

Control or antenna	Function
Sense whip antenna.	When extended and in conjunction with the loop antenna having the opposite edge of the loop antenna facing the transmitted signal, determines (senses) the direction from which the signal is transmitted.

Section III. OPERATION UNDER USUAL CONDITIONS

Caution 1: Use the AT-784/PRC for reception only. *Do not transmit when the AT-784/PRC is connected to the radio set; remove all other antennas from the radio set.*

Caution 2: Keep the ATTENUATOR switch to O whenever the AT-1082/PRC is not in use.

2-7. General

a. *Modulated and Unmodulated Carrier.* Direction finding of, or homing-in on, a transmitting station is accomplished by detecting its modulated or unmodulated carrier. Usually, it is better to home-in on the unmodulated carrier signal than a voice or test tone; the test tone or voice is best used when the transmitting signal is somewhat distant from the AT-1082/PRC. When the transmitting site is nearby, with the carrier modulated or unmodulated, it is better to follow the carrier indication rather than the modulation feature.

- (1) *Modulated carrier.* Modulation of the transmitter carrier frequency occurs when voice, music, test tone, etc., are transmitted.
- (2) *Unmodulated carrier.* This action occurs when the transmitter is turned on but the carrier frequency is not modulated by voice, music, test tone, etc. On amplitude modulation transmission (am), the transmitter is detected by the quieting of the noise when the receiver is turned in the area of the transmitter frequency. On frequency modulation (fm) transmission, the transmitter is detected by the lessening or stopping of the rushing noise

when the receiver is tuned to the area of the transmitter frequency.

b. *Maximum Signal.* The terms maximum signal and maximum are used to define the position of the loop antenna when it is so oriented that the greatest signal response (maximum signal) is heard in the receiver. This occurs when the sense whip antenna is extended for sensing (*d* below). At this time, a greater response is obtained on the receiver when that edge of the loop antenna opposite the edge in which the sense whip antenna is mounted faces the transmitter. When the sense whip antenna is retracted, signals of equal intensity are obtained from either edge of the loop antenna.

c. *Null Signal.* The terms null position and null are used to define the position in which the loop antenna is oriented when minimum or no signal response is heard on the receiver. This occurs when either broadside of the loop antenna is facing the transmitting station. The two nulls are defined properly when the sense whip antenna is retracted. The null gives a sharper or more accurate indication than the maximum sense position (*d* below). Consider the loop antenna as an enlarged gun-sighting device; it is necessary to look through the hole formed by the loop antenna toward the transmitting station. This will be the same direction as the maximum signal from the edge of the loop antenna (*d* below). In the presence of a strong signal, the null will be more clearly defined and quite narrow; the rotation of a few degrees will produce sharp variations in the received signal. On a weaker signal, the width

of the null may increase to 30° or 40°. The center of the null (or area) is the correct bearing.

d. Sensing. Because there are two nulls, the null indication does not provide sufficient information for the operator to determine whether the transmitting source is in front of, or behind, the loop antenna. To find the actual direction of the transmitting source, a null is detected, the sense whip antenna is extended, and the loop antenna is turned sideways to the transmitting signal. When the signal is loudest in the receiver, the SIGNAL MAX arrow on the top of the case (fig. 2-3) will point in the direction of (sense) the transmitting signal.

e. Homing. Homing is the procedure of detecting a transmitting station and approaching it. The general procedure is as follows:

- (1) Find the null.
- (2) Determine the sense and take a bearing on the transmitting station as indicated by the SIGNAL MAX arrow on the top of the case (fig. 2-3).
- (3) When the direction of the transmitting station is determined, the sense whip antenna is retracted, the loop antenna is turned broadside to the transmitting station, and the null indication is detected on the receiver. If the null is particularly broad, rotate the loop antenna back and forth a few times. Select the center of the null, and proceed on a line through the center of the null until the transmitting station is reached.
- (4) As the transmitter is approached, successive bearings can be taken with increased accuracy because of the narrowing null area which results from increased signal strength.

f. Attenuation.

Caution: Whenever the loop antenna is not in use, keep the ATTENUATOR switch at 0.

- (1) Very strong signals may have a tendency to obscure the null and sense indication. In general, such signals will be found close to the transmitter. If the hearings are obscured and the transmitter cannot be seen, advance the ATTENUATOR switch to position 1, 2, 3, or 4 to reduce the signal strength to the point, where the null becomes clear.

- (2) Positions 1, 2, 3, and 4 provide increasing and marked differences in attenuation. The position of least attenuation that permits sense and bearing determination should be used. operation in ATTENUATOR position 4 is not normally used except in the immediate vicinity of the transmitting station (within 100 to 200 yards depending on the terrain). An accurate sense indication will be difficult, to obtain in this position, but this condition should not present any operating difficulties since the general direction of travel has been previously established and the null bearing should be sufficient for transmitter location.

2-8. Operation

The operating procedure of Antenna AT-1082/PRC for homing-in on a modulated or unmodulated carrier is described below. On the receiver, the greatest, signal response (maximum signal) for a modulated carrier is indicated by a loud audio output ; for an unmodulated carrier, the indication is indicated by maximum receiver quieting.

a. Preliminary.

- (1) Check to see that the AT-1082/PRC is connected to the receiver (para 2-3). Remove all other antennas from the receiver. Set the ATTENUATOR control to 0.
- (2) On the receiver, tune to the operating frequency, set the volume control for maximum loudness, and set the squelch control to off when there is such a provision.

b. Procedure.

- (1) Unfold the loop antenna, and set the BANDSWITCH and FINE TUNE controls to the positions that are closest to the frequency setting on the receiver. *For example*, to tune to 45.80 MHz, set the BANDSWITCH control to 40 and the FINE TUNE control to 5.
- (2) Hold the AT-1082/PRC vertically (fig. 2-2), and rotate it clockwise and counter-clockwise for maximum signal indication on the receiver. Readjust the FINE

TUNE control for a greater output signal on the receiver. A maximum signal indication will be indicated by a loud audio output on the receiver because of a modulated carrier or by maximum receiver quieting because of an unmodulated carrier.

Caution: Do not use the FINE TUNE control setting as a standard in determining the transmitter frequency.

- (3) Adjust the ATTENUATOR control for comfortable audio output from the receiver. At this point, the AT-1082/PRC loop antenna is oriented edgewise to the transmitting source.
- (4) To determine the direction of the signal source, proceed as follows:
 - (a) Rotate the loop antenna 90° to obtain a null indication on the receiver. The loop antenna is now broadside to the signal source and is indicated by the SIGNAL NULL arrows on the signal direction label on top of the case (fig. 2-3).
 - (b) Extend the sense whip antenna. This action will cause a signal output from the receiver. Starting with the broadside position (a) above, listen for the maximum output signal while rotating the loop antenna clockwise and then counterclockwise from the broadside position. Set the AT-1082/PRC to the position that provides the strongest signal indication in the receiver. The loop antenna is again in line with the transmitting signal source, and the signal source is in the direction away from the sense whip antenna, as indicated by the SIGNAL MAX arrow on the signal direction label. (* See below.)
- (5) Retract the sense whip antenna, and, using the loop antenna, home-in on the signal source with the null indication.
- (6) Adjust the ATTENUATOR control for a comfortable listening level of the received signal.

Section IV. OPERATION UNDER UNUSUAL CONDITIONS

2-9. General

Operation of Antenna AT-1082/PRC may be difficult in regions where extreme cold, heat, humidity and moisture, sand conditions, etc., prevail. In paragraphs 2-10 and 2-11, instructions are given on procedures for minimizing the effect of unusual operating conditions.

2-10. Operation in Arctic Climates

Subzero temperatures and climatic conditions associated with cold weather affect the efficient operation of this equipment. Instructions and precautions for AT-1082/PRC operation under such adverse conditions are as follows:

- a. Handle the equipment carefully.
- b. Keep the equipment warm and dry.
- c. Keep frost or ice from accumulating on the loop frame; such accumulations will prevent the loop from being opened or closed and will prevent the sense whip antenna from being extended or retracted.

*** For better orientation, the operator holds the AT-1082/PRC at eye level and with SIG MAX arrow pointing away from himself (fig. 2-2) moves his body cw and ccw to rotate the AT-1082/PRC.**

d. Moisture will condense on equipment that has been exposed to the cold and is brought into a warm room; it will continue to do so until room temperature is reached. This condition also arises when equipment warms up during the day after exposure during a cold night. When the equipment has reached room temperature dry it thoroughly.

2-11. Operation in Desert Climates

The main problem when operating this equipment in desert areas is the large amount of sand or dust and dirt which enters its moving parts. Therefore, Antenna AT-1082/PRC should be stored in dust proof containers when it is not in use. When using this equipment, keep it as free from dust and sand as possible. Excessive accumulation of sand, dust, or dirt on the loop frame will prevent the sense whip antenna from being extended or retracted as required.

CHAPTER 3

OPERATOR'S AND ORGANIZATIONAL MAINTENANCE INSTRUCTIONS

Section I. OPERATOR'S MAINTENANCE

3-1. Scope of Operator's Maintenance

The maintenance duties assigned to the operator of Antenna, Loop AT-784/PRC, are listed below, together with references to the paragraphs covering the specific maintenance functions. The duties assigned do not require tools or test equipment, but two radio sets (AN/PRC-25, or equivalent) are required for operational checkout: One for transmitting purpose and one for receiving AT-1082/PRC outputs.

- a. Preventive maintenance (para 3-2).
- b. Preventive maintenance checks and service periods (para 3-2).
- c. Daily preventive maintenance checks and services chart (para 3-4).
- d. Weekly preventive maintenance checks and services chart (para 3-5).
- e. Cleaning (para 3-6).

3-2. Preventive Maintenance

Preventive maintenance is the systematic care, servicing, and inspection of equipment to prevent the occurrence of trouble, to reduce downtime, and to make sure that, Antenna, Loop AT-784/PRC, is in a combat serviceable condition at all times. Because of moisture and fungus growth, the maintenance of this antenna in tropical climates is more difficult than under temperate climatic conditions. The high relative humidity causes condensation to form on the equipment; this is especially true when temperature of the equipment becomes lower than the surrounding air. To minimize this condition, keep this type of antenna sheltered and off the ground as much as possible.

a. *Systematic Care.* The procedures given in paragraphs 3-4 through 3-6 cover routine care and cleaning essential to proper upkeep and operation of the equipment.

b. *Preventive Maintenance Checks and Services.* The preventive maintenance checks and services charts (paras 3-4 and 3-5) outline functions to be performed at specific intervals. These checks and services are to maintain Army electronic equipment in a combat serviceable condition; that is, in good general (physical) condition and in good operating condition. To assist operators in maintaining combat serviceability, the charts indicate what to check, how to check, and what the normal conditions are; the *References* column lists the illustrations, paragraphs, or manuals that contain detailed repair or replacement. procedures. If the defect cannot be remedied by the operator, higher category 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.

3-3. Preventive Maintenance Checks and Service Periods

Preventive maintenance checks and services of the AT-784/PRC are required on a daily and weekly basis. Paragraphs 3-4 and 3-5 specify the checks and services that must be accomplished on a daily and weekly basis, respectively, and under the special conditions listed below.

- a. When the equipment is initially installed.
- b. When the equipment is reinstalled after removal for any reason.
- c. At least once each week if the equipment is maintained in standby condition.

3-4. Daily Preventive Maintenance Checks and Services Chart

Sequence No.	Item to be inspected	Procedure	References
1	AT-1082/PRC, sense whip antenna.	Inspect for bends and distortion -----	
2	AT-1082/PRC, loop antenna.	Check to see that loop antenna, opens to operating position without, binding.	
3	AT-1082/PRC, controls.	Observe effect on signal during operating procedures	Sequence numbers 5 through 20 below.
4	Cables	a. Inspect for damaged connectors. b. Check for tight connections	a. None. b. Sequence numbers 7 and 8 below.
5	Connections	All antenna and cable connections should be fingertight. Check and tighten when necessary.	Para 2-3.
6	Controls	Check to see that the mechanical action of each control is smooth and free of external or internal binding.	Fig. 2-3, para 2-6.
7	Antenna parts	a. Check to see that the loop antenna can be easily placed into its operating position and that it locks in its detented position. b. Check to see that the sense whip antenna can be extended its full height (12 inches) and remain there. c. Check to see that the sense whip antenna and loop antenna may be returned, respectively, to their nonactive positions d. Check to see that the shield cap is attached to the CG-3344/PRC.	a. Fig. 2-3. b. Same as a above. c. Same as a above. d. Fig. 1-1.
8	CG-3344/PRC (5-ft) . . .	a. Connect the cable to the radio receiver and the AT-1082/PRC; if applicable, attach the shield cap to the radio antenna connector. b. Check the connections for tightness ----- c. Check the shield cap for snug fit on the antenna connector of the radio and for connection to the CG-3344/PRC.	a. Para 2-3, fig. 1-1. b. None. c. Same as a above.
9	CG-2840A/U (12-ft) . . .	a. Connect the CG-2840A/U between the CG-3344/PRC and the radio receiver. b. Check the connections for tightness ----- c. Continue to the operational checks -----	a. Fig. 1-1. b. None. c. Sequence numbers 11 through 20 below.
10	AT-1082/PRC	a. Make all transmission and reception arrangements with a distant radio transmitter before connecting the AT-1082/PRC to the receiver. Note the direction of the transmitter. Arrange with the distant transmitting station to turn on its transmitter long enough to make the AT-1082/PRC tests. b. To start the test, set the transmit and receive frequency to 30 MHz. If the tactical situation will not permit this arrangement, use the assigned operating frequency. Caution: Do not transmit from the radio set connected to the AT-1082/PRC; damage to the equipment may result. c. On the receive radio set, make the following adjustments: (1) Set the volume control for maximum signal output. (2) set the squelch control, if provided, to off.	
11	AT-1082/PRC. controls and antennas.	a. Set ATTENUATOR to 0; BANDSWITCH to 30 (or to position corresponding to assigned operating frequency); and FINE TUNE to 0 (or to position corresponding to assigned operating frequency); b. Set the loop antenna in operating position and extend the sense whip antenna.	Para 2-6 and sequence No. 10 above.

Sequence No.	Item to be inspected	Procedure	References
12	AT-1082/PRC - - - - -	<ul style="list-style-type: none"> a. Position the loop antenna so that the SIGNAL MAX arrow on the signal direction label is toward the transmitting station. Note the level of the received signal. b. Rotate the loop antenna 180°. The received signal should be lower. c. Set the loop antenna in the original position (a above). 	Fig. 2-3, para 2-7d.
13	AT-1082/PRC, ATTENUATOR control.	<ul style="list-style-type: none"> a. Turn ATTENUATOR control to positions 1, 2, 3, and 4. At each position, signal level should be lower. b. Set the ATTENUATOR control for a comfortable listening level on receiver. 	
14	AT-1082/PRC, FINE TUNE control.	<ul style="list-style-type: none"> a. Rotate the FINE TUNE control to each of its other positions. Received signal level should be lower as control is moved away from the original setting. b. Reset the FINE TUNE control to original position. 	
15	AT-1082/PRC, BANDSWITCH control.	<ul style="list-style-type: none"> a. Rotate the BANDSWITCH control to each of its other positions; no signal is received on the receiver in the other positions. b. Reset to the original position. 	
16	AT-1082/PRC, null position.	<ul style="list-style-type: none"> a. Retract the sense whip antenna. b. Rotate the loop antenna 90°; it is now broadside to the transmitting station. The received signal level should lessen or the signal should disappear. 	
<p>Note. If the tactical situation permits use of other frequencies, use the procedures given in sequence numbers 17 through 20 below, to test the operation of the AT-1082/PRC in 40-, 50-, 60-, and 70-MHz bands, and disconnect the AT-1082/PRC from the radio receiver. Communicate with the distant radio station and arrange for it to transmit using 45, 55, 65, and 75 MHz, in turn, while making the tests given in sequence numbers 17 through 20 below which are associated with each frequency.</p>			
17	AT-1082/PRC, BANDSWITCH and FINE TUNE controls (45 MHz).	<ul style="list-style-type: none"> a. Set BANDSWITCH to 40 and FINE TUNE to 5, b. Tune receiver to 45 MHz. c. Repeat procedures given in sequence numbers 14 through 16 above. 	
18	AT-1082/PRC, BANDSWITCH and FINE TUNE controls (55 MHz).	<ul style="list-style-type: none"> a. Set BANDSWITCH to 50 and FINE TUNE to 5. b. Tune receiver to 55 MHz. c. Repeat procedures given in sequence numbers 14 through 16 above. 	
19	AT-1082/PRC, BANDSWITCH and FINE TUNE controls (6.5 MHz).	<ul style="list-style-type: none"> a. Set BANDSWITCH to 60 and FINE TUNE to 5. b. Tune receiver to 65 MHz. 	
20	AT-1082/PRC, BANDSWITCH and FINE TUNE controls (75 MHz).	<ul style="list-style-type: none"> c. Repeat procedures given in sequence numbers 14 through 16 above. a. Set BANDSWITCH to 70 and FINE TUNE to 5. b. Tune receiver to 7.5 MHz. c. Repeat procedures given in sequence numbers 14 through 16 above. 	

3-5. Weekly Preventive Maintenance Checks and Services Chart

The preventive maintenance checks and services of Antenna AT-1082/PRC that are listed below are required weekly. The *References* column of

this chart lists the illustrations, paragraphs, or manuals that contain detailed repair or replacement instructions to be followed while performing the procedure.

Sequence No.	Item to be inspected	Procedure	References
1	Completeness	Inspect for completeness of – a. Publications (check to see that they are complete, serviceable, and current). b. Components	a. DA Pam 310-4. b. Fig. 1-1, app. B.
2	Exterior surfaces	Clean the AT--1082/PRC, extended sense whip antenna, cables, and CW-445/PRC.	Para 3-6.
3	Cables	Inspect cables for cuts, broken insulation and looseness of connectors on cable.	
4	Shield cap assembly	Check for connection to CG-3344/PRC	Fig. 1-1

3-6. Cleaning

Inspect the exterior surfaces of Antenna, Loop AT-784/PRC, including the exterior of its sense whip antenna. All exterior surfaces should be clean and free of dirt, grease, and fungus.

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

Warning: Prolonged breathing of cleaning compound is dangerous; make certain that adequate ventilation is provided. Cleaning compound is flammable; do not use near a flame.

Avoid contact with the skin; wash off any that spills on your hands.

b. Remove grease, fungus, rust, and ground-in dirt from the surfaces using a cloth dampened (not wet) with cleaning compound (FSN 7930-395-9542).

c. Remove dust or dirt from the connector with a brush.

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

Section II. ORGANIZATIONAL MAINTENANCE

3-7. Scope of Organizational Maintenance

This section contains instructions covering organizational maintenance of Antenna AT-1082/PRC. The duties of an organizational repairman are limited to the responsibilities listed below in addition to those performed by the operator (para 3-2 through 3-6).

- a. Monthly preventive maintenance (para 3-8).
- b. Monthly preventive maintenance checks and services (para 3-9).
- c. Touchup painting (para 3-10).
- d. Replacement of parts (para 3-11).

the monthly preventive maintenance checks and services chart (para 3-9) 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. Adjustments of the maintenance interval must be made to compensate for any unusual operating conditions. Equipment maintained in a standby (ready for immediate operation) condition must have monthly preventive maintenance checks and services performed on it. Equipment in limited storage (requires service before operation) does not require monthly preventive maintenance.

3-8. Monthly Preventive Maintenance

Perform the maintenance functions indicated in

3-9. Monthly Preventive Maintenance Checks and Services Chart

Sequence No.	Item to be inspected	Procedure	References
1	AT-1082/PRC, exterior surfaces.	Repaint if necessary -----	Para 3-10.
2	Cover assembly gasket.	a. Put small amount of silicone grease on its surface -----	a. Fig. 2-3, para 3-11a.
3	Screws -----	b. Replace If necessary ----- Tighten screws holding knobs of controls and cover assembly -----	b. Para 3-11a.
4	Sense whip antenna ----	Replace if it does not retract fully, is bent, or comes free -----	Para 3-11b.
5	CW-445/PRC	Inspect for tears, mildew, fraying, and attachment to strap -----	Fig. 1-1.

3-10. Touchup Painting

a. When the finish on the case has been badly scarred or damaged, rust and corrosion can be prevented by touching up the bared surfaces. Use No. 000 sandpaper to clean the surface down to the bare metal and to obtain a smooth finish.

Caution: Do not use steel wool. Minute particles may enter the case and cause harmful internal shorting or grounding of the circuit.

b. When a touchup job is necessary, apply paint with a small brush. Remove rust from the case by cleaning corroded metal with cleaning compound. In severe cases, it may be necessary to use cleaning compound to soften the rust, and sandpaper to complete the preparation for painting. Paint used will be authorized and consistent with existing regulations (TB SIG 364).

**3-11. Replacement of Parts
(fig. 2-3)**

For parts replacement, prepare a clean, flat work surface for the unit. Thoroughly wipe off dirt, grease etc., particularly if found between the cover and the case. Use an airhose, if necessary.

a. *Cover and/or Cover Assembly Gasket.* To replace the cover and/or the cover assembly gasket, proceed as instructed below. (For lubrication only, omit the procedures given in (2) and (3) below:)

- (1) Loosen the six captive screws that hold the cover assembly, and remove the cover assembly from the case.
- (2) Pull the gasket from the cover.

Caution: Do not stretch the gasket by pulling it from one point to another during its installation.

- (3) Lay the new gasket over its track on the cover and press it into place.
- (4) With the fingers, spread a thin coating of silicone grease on the surface of the gasket.
- (5) Place the cover on the case, making sure that the gasket is seated properly, and tighten the cover down with its six captive screws.

b. *Sense Whip Antenna.* To replace a whip antenna in the loop antenna assembly, proceed as follows:

- (1) Set the loop antenna (3, fig. 4-6), in operating position.
- (2) Hold the loop antenna and loosen the whip antenna assembly nut (22) with a hexagonal wrench. Completely unscrew the nut, and remove the telescoping whip antenna (21).
- (3) Apply a thin layer of silicone grease to the threads on the assembly nut of the sense whip antenna to be mounted. Partially place the assembly into position on the loop antenna. Extend the sense whip antenna from its assembly, and screw the assembly nut in place by hand; then, tighten the nut with the hexagonal wrench.

c. *Control Knobs.* Use the following procedure for replacement of the 13 BANDSWITCH, FINE TUNE, and the ATTENUATOR control knobs.

- (1) Note the position of the control knob (for example: BANDSWITCH set to 30).
- (2) Remove the screw that, holds the control knob in position.

- (3) Lift and remove the control knob from the associated shaft.
- (4) Clean the shaft and the case surface from which the control knob was removed.
- (5) Mount the new control knob on the shaft so that it is set in the same position as the knob which was removed ((1) above).
- (6) Hold the control knob in position, and tighten down its retaining screw.

CHAPTER 4

DIRECT SUPPORT MAINTENANCE

Section I. FUNCTIONING OF EQUIPMENT

4-1. Scope

This chapter contains instructions for direct support maintenance of Antenna AT-1082/PRC. It includes instructions appropriate for troubleshooting, testing, alining, repairing the equipment and replacing maintenance parts by repairmen at this maintenance category. It also lists the associated tools, materials, and test equipments. Detailed functions of the AT-1082/PRC are covered in paragraphs 4-2 through 4-4.

4-2. Antennas

a. *General.* During transmission, a radiofrequency (RF) current in a conductor produces an electromagnetic field that is radiated into space. This field consists of electric and magnetic fields that are at right angles to each other. The plane parallel to the mutually perpendicular lines of electric and magnetic flux is called the wavefront. The wave travels in a direction at right angles to the wavefront.

b. *Receiving Antennas.*

- (1) If the radiated electromagnetic field cuts a conductor, current is induced into that conductor. The received current varies in accordance with the variations of the electromagnetic field. Therefore, a variation of the current in a radiating antenna causes a similar varying current in a conductor at a distant location.
- (2) Antennas receive more energy in some positions than they do in others. This directivity is due to the fact that received energy depends on the amount of radiated field that is cut by the antenna. A horizontal antenna receives maximum energy when its vertical plane is parallel to the plane of the wavefront because maximum interception occurs in this position. A vertical antenna has the same reception strength from all horizontal directions because the amount of radio field that it

intercepts remains constant. Typical field strength patterns for vertical and horizontal antennas are illustrated in A and B, figure 4-1.

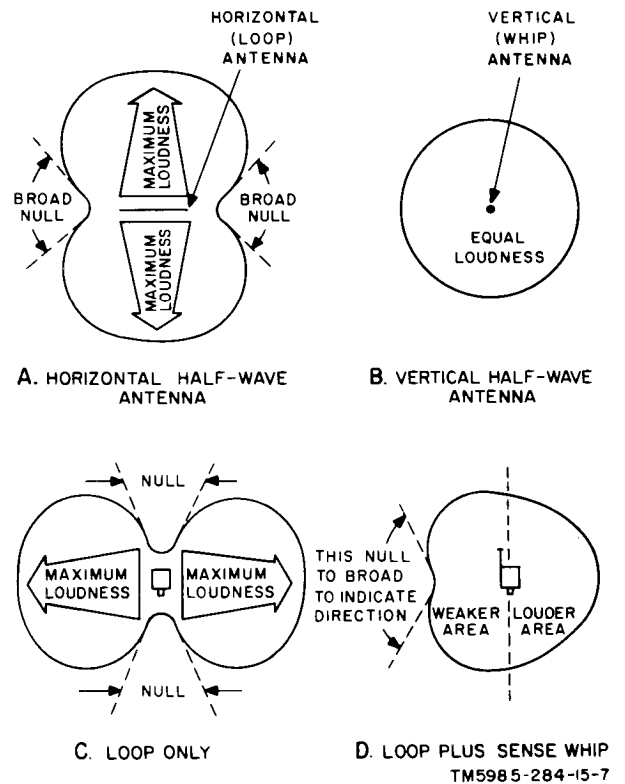


Figure 4-1. Antenna field strength patterns.

4-3. Direction Finder Antennas

a. *General.* Since fundamental half-wave antennas possess directional characteristics, it is possible to determine the direction from which a radio signal is being received. This determination is made by rotating the receiving antenna about an axis that is perpendicular to the direction of the signal and observing the changes in received signal strength. However, as can be seen from the radiation pattern in A, figure 4-1, the directional

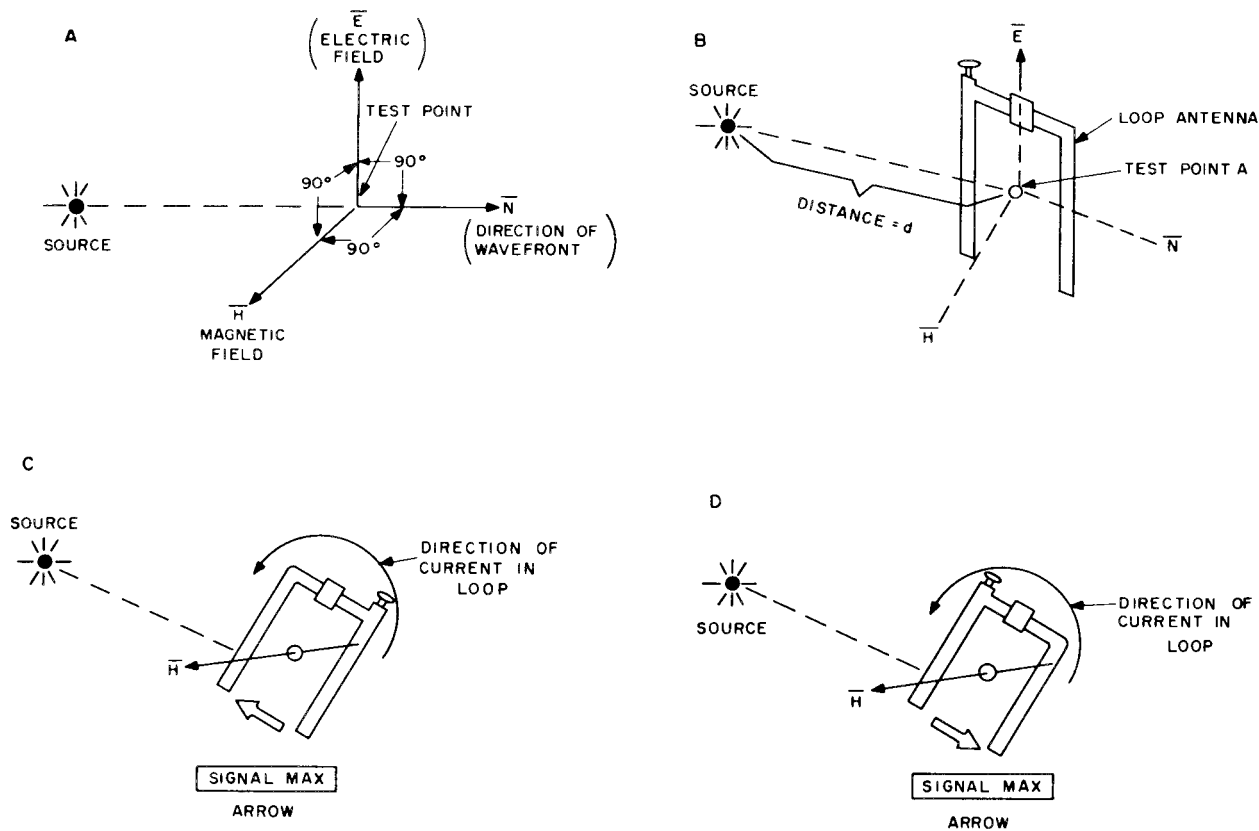
pattern produced by a simple half-wave dipole contains broad maximum and minimum points. To take a reasonably accurate bearing on the direction of a received signal, it is necessary to have an antenna with relatively sharp maximum (or minimum) response points with fairly large differences in sensitivity existing between the maximums and minimums. The loop antenna has these characteristics.

b. Loop Antennas. A loop antenna consists essentially of a wire that "is shaped to form a loop." It produces a directional response pattern similar to a *figure 8*, containing two broad maximums and two relatively sharp minimums or nulls (C, fig 4-1). This pattern is oriented with respect to the loop so that maximum response is obtained when either edge of the loop or either SIGNAL NULL arrow is pointed toward the transmitter, and minimum response is obtained when the plane of the loop is broadside to the transmitter. The points of minimum response (nulls) are used to indicate direction, because they are defined more sharply than the points of maximum response and, therefore, make it easier to take an accurate bearing.

- (1) Refer to figure 4-2. Consider some point source which will cause electric fields (\vec{E}) and magnetic fields (\vec{H}) to be seen at every point in space. As the points are set farther from the source, the magnitude of the two fields (\vec{E} and \vec{H}) will diminish. Pattern A, figure 4-2, shows some point source and the associated fields at a test point within vicinity of the source. The loop antenna will be seen to have differing pickup that depends on its orientation with respect to the source. Pattern D, figure 4-2, shows a test setup (for Antenna AT-1082/PRC) with the SIGNAL MAX arrow pointing away from the source which is idealized for simplicity.
- (2) Refer to C, figure 4-2. If the distance (d) from the source to the test point (see B, fig. 4-2) is considerably larger than the spacing of the two vertical portions of the loop antenna, the difference in the electric field between these two sides is negligible. Note that the magnetic field (\vec{H}) is flowing directly through the center of the loop. When such a magnetic field

cuts through a turn of wire, a current is caused to flow in the wire. When the SIGNAL MAX arrow points directly to the source, the magnetic field (\vec{H}) will cause the greatest amount of current to flow in the loop. Therefore, when the SIGNAL MAX arrow points to the source, the maximum signal is detected. If the loop is turned around 180° (D, fig. 4-2), the action is identical with the preceding, and the maximum signal is also received.

- (3) The next orientation of the loop for examination is made with the SIGNAL MAX arrow perpendicular to the line (\vec{N}) between the source and the loop antenna (B, fig. 4-3). Now, the magnetic field (\vec{H}) will not produce any current to flow in the loop; if the loop antenna is again turned 180° , an identical effect will be produced. This analysis shows that the loop is actually sensitive to the magnetic field of the electromagnetic wave. The sense whip antenna will be sensitive to the electric field (\vec{E}) as shown in C, figure 4-3. Therefore, since \vec{H} is always perpendicular to the sense whip antenna, it does not produce any effect. The electric field (\vec{E}) is always parallel to the sense whip antenna and will cause a voltage to be induced in it.
- (4) Refer to D, figure 4-3. With the sense whip antenna extended, Antenna AT-1082/PRC is a combination of the loop and the sense whip antenna. It is from this combination that the sensing is desired. The dotted arrow in pattern D, figure 4-3, is the current that is made to flow because of the magnetic field (\vec{H}) action on the loop. The arrow composed of triangles, indicates the current caused to flow because of the electric field (\vec{E}) action on the sense whip. Both of these currents will circulate in a counterclockwise direction and will therefore add to each other. Pattern E, figure 4-3, shows the loop antenna rotated 180° . Since the analysis for this pattern is identical to the one for pattern D, figure 4-3, it shows that the two current components buck



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Figure 4-2. Radiation wavefront pickup.

each other with only a small resultant current. Therefore, when the sense whip antenna is extended, the loudest signal will be received when the SIGNAL MAX arrow points toward the source.

4-4. Antenna AT-1082/PRC

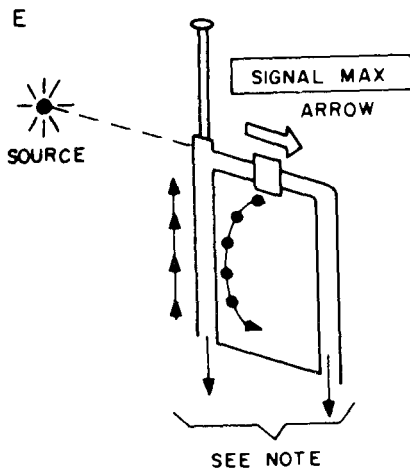
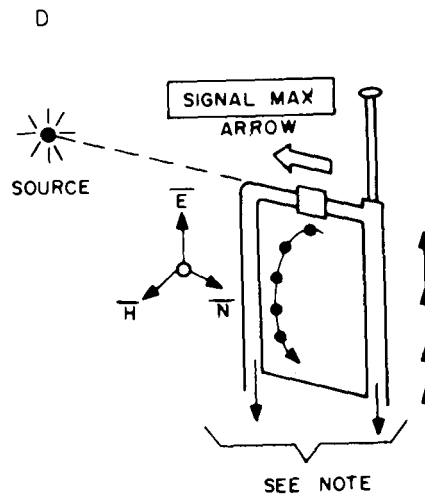
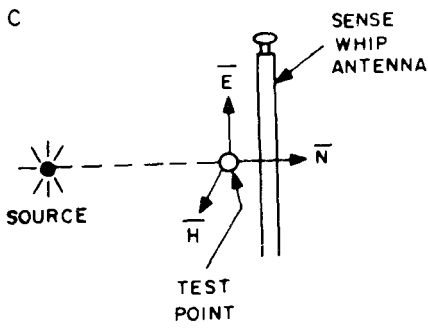
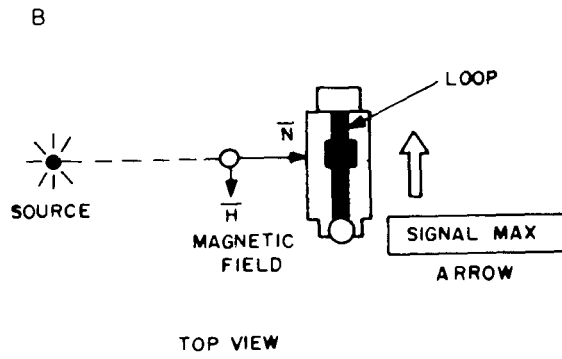
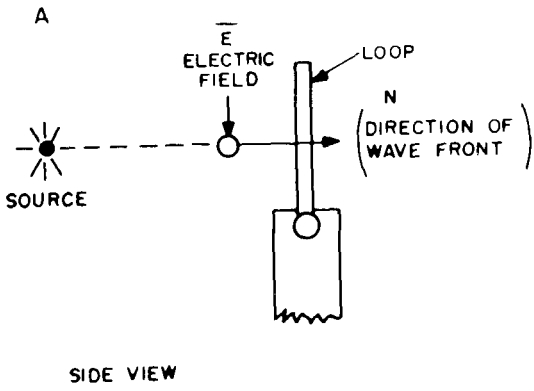
(fig. 4-4)

a. The loop antenna has a rectangular shape and measures approximately 3 inches by 6 inches with the loop being completed through the case. Tapped transformer L1 is connected across the terminals of the loop and provides inductive coupling between the loop and transmission line.

b. The bearing obtained with a loop antenna will be incorrect unless the loop is carefully balanced electrostatically to ground. If the loop was not balanced this way, there would be a residual antenna effect that would distort the directional pattern of the loop.

c. Overall tuning of the loop is accomplished by the positioning of BANDSWITCH A2S1 and FINE TUNE control capacitor C1. For the 30- to 40-MHz band, transformer L1 is tuned over a 10-MHz range by the tuning or positioning of capacitor C1 when A2S1 is set to 30. The output is then coupled from the tap on L1. For tuning the other ranges (40 to 50 MHz, 50 to 60 MHz, 60 to 70 MHz, or 70 to 76 MHz), the BANDSWITCH, transformer L1, and capacitor C1 are connected to the associated parallel-resonant network. To tune the 40- to 50-MHz range, for example, inductor A2L4 is connected in parallel with L1 and capacitor A2C4 is connected in series with tuning capacitor C1. The tuning of C1 will then provide a 10-MHz range between 40 to 50 MHz. This fine tuning is obtained by interpolation of the mega-Hertz steps in positioning of the tuning of C1.

d. Attenuation is provided by a step attenuator that consists of a ladder-type pi-network composed

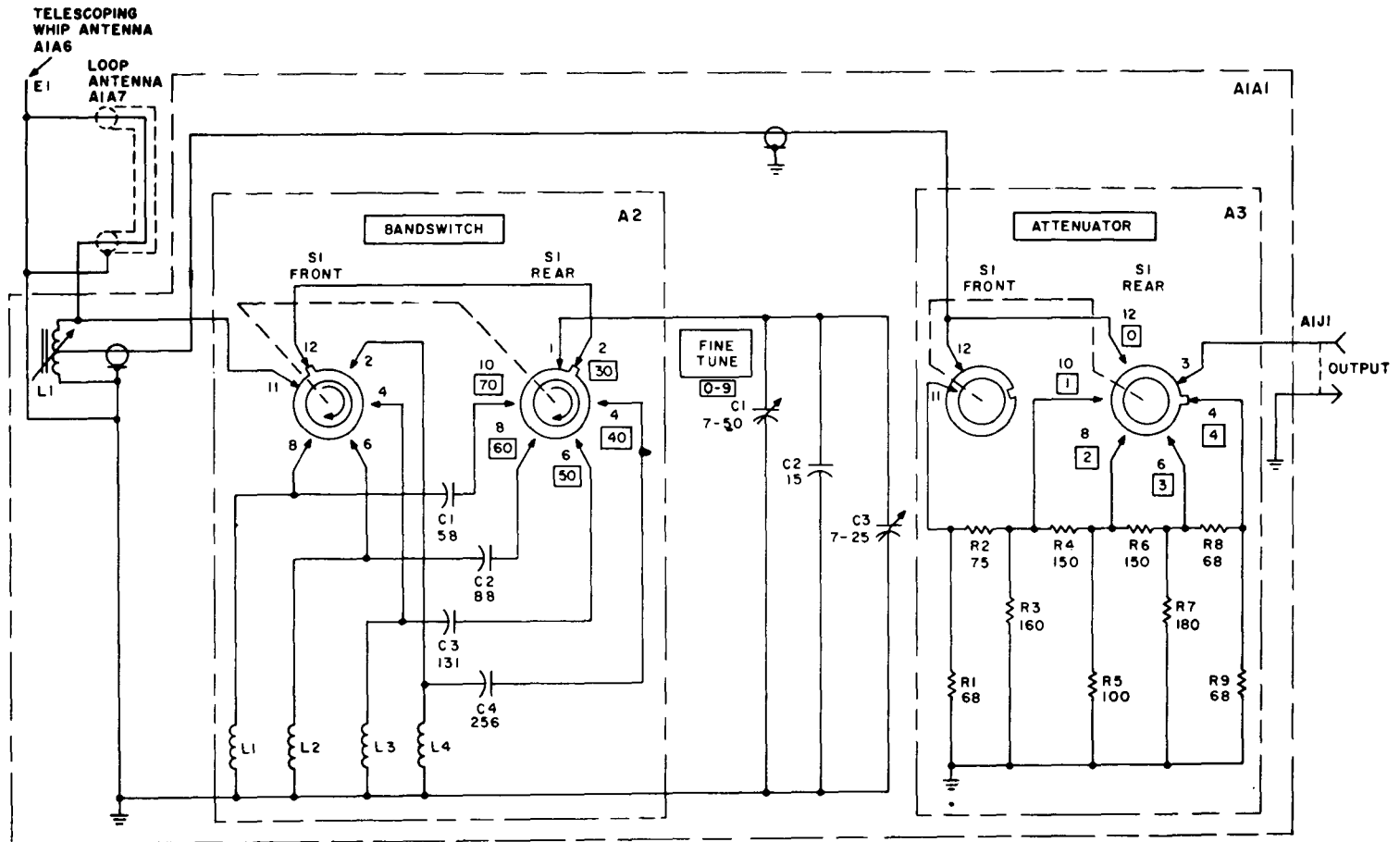


NOTE:
CONNECTED TO INDUCTOR AIT1.

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Figure 4-3. Analysis of sense whip antenna.

Figure 4-4. Antenna AT-1082/PBC (assembly A1), schematic diagram.



NOTES:

1. UNLESS OTHERWISE INDICATED, RESISTANCES ARE IN OHMS, CAPACITANCES ARE IN UUF.
2. WAFER SWITCHES SHOWN IN EXTREME COUNTERCLOCKWISE POSITION AND ARE VIEWED FROM FRONT.
3. INDICATES EQUIPMENT MARKING.

Change 1 4-5

of resistors R1 through R9 on subassembly A3. The amount of attenuation is selected by ATTENUATOR switch A3S1 in four steps. Each of the first three steps provides approximately 10 decibels (db) of attenuation, and the fourth step provides approximately 6 db of attenuation. The 0 position of switch A3S1 couples a tap of L1 directly to RF output connector J1. This antenna has an output impedance of approximately 50 ohms.

e. As shown in C, figure 4-1, the pattern of a simple loop passes two identical nulls and two identical maximum points, 180° apart. The pattern leaves 180° uncertainty as to the direction of the transmitter regardless of which technique (maximum points or nulls) is used to find the direction. Since the transmitter may be either in front of or behind the loop, another element is used to eliminate one direction. The sense of the bearing can be determined by introducing a small voltage derived upon raising the vertical sense whip antenna. This sense whip antenna is a simple vertical whip antenna, 12 inches long, whose output is mixed with that of the loop. The sense whip antenna current, caused by electric field activity, combines with the loop circuit current in transformer L1. The vector addition of these currents produces the desired cardioid response (pattern D, fig. 4-1).

f. Superimposing the circular sense pattern over the loop pattern (since they occur at the same instant) provides the loop plus sense cardioid pattern in D, figure 4-1. In D, figure 4-3, the vectors show the loop aimed at the transmitting station. The dotted arrow represents the current in any direction, while the arrow composed of triangles represents the current flow within the loop (as shown in C, fig. 4-2) with the loop aimed at the station. Since both of these currents circulate in the same

direction, they add together and provide a marked increase in output signal to point the way to the station. In E, figure 4-3, the vectors show the loop aimed away from the transmitting station. The dotted arrow is the same current, while the arrow composed of triangles is the loop output current (as shown in D, fig. 4-2) with the loop away from the station. Since these current components oppose each other, very little output is obtained, proving this is not the true direction to the station. By similarly summing up the circular sense pattern and the figure 8 loop pattern in all directions, the cardioid pattern is obtained.

g. While the sensing definitely points the direction to the transmitter, the broadness of the lobe makes it difficult to spot the bearing sharply enough. Using the null to sharpen the bearing and following the null to the station (para 2-7e) are standard direction finding practices. If the operator loses his bearings and has difficulty in relocating the general direction of the transmitter, the sense operation should be repeated.

h. The sensing current must be equal to, or slightly less than, the net loop current. If the sense current is too small, a pattern consisting of one large lobe, one small lobe, and two nulls less than 180° apart is produced. If the sense current is too high, it will mask the loop characteristics and produce a pattern with an indistinct maximum and minimum.

i. For proper operation of Antenna AT-1082/PRC, the signal output (applied to the limiter of a receiver) should be of such an amplitude as to appear on the slope of the limiter curve. To accomplish this, the step attenuator circuitry of AT-1082/PRC, which consists of a ladder-type pi-network of resistors, may be used as required (d above). The amount of attenuation depends upon the position of the ATTENUATOR switch (fig. 4-4).

Section II. DIRECT SUPPORT TROUBLESHOOTING AND REPAIR

4-5. Organization of Troubleshooting

a. General. The first procedure in servicing a defective AT-1082/PRC is to sectionalize the fault. Sectionalization means tracing the fault to the unit or component of the AT-1082/PRC. The second procedure is to localize the fault. Localization means tracing the fault to a defective part responsible for the abnormal condition. Some faults, such as an open transformer, inductor, or capacitor can often be located by sight or hearing. The majority of faults, however, must be located by making continuity and/or resistance checks.

b. Sectionalization. Listed below is a group of tests arranged to reduce unnecessary work and to aid in tracing trouble in a defective Antenna AT-1082/PRC. The first procedure is to locate the unit at fault by the following methods:

(1) *Visual inspection.* The purpose of visual inspection is to locate faults without testing or measuring circuits. All meter readings scope patterns, or other visual signs should be observed and an attempt made to sectionalize the fault within Antenna AT-1082/PRC.

(2) *Operational tests.* Operational tests frequently indicate the general location of trouble. In many instances, the tests will help in determining the exact nature of the fault. The operational checks and equipment performance checklist (para 3-4b) make up a good operational test.

c. Localization. After the trouble has been sectionalized (b above), the methods listed in the troubleshooting chart (para 4-8) will aid in local-

izing the trouble to a circuitry stage within the suspected AT-1082/PRC. The meter indications, or lack of meter indications, and the operational checks provide a systematic method of localizing trouble to a circuitry stage. Parts location is indicated in figure 4-5.

4-6. Test Equipment Required

The following chart lists the test equipment required for troubleshooting Antenna AT-1082/PRC.

Test equipment	Technical manual	Common name
Multimeter TS-352/U... Tool Kit, Radar and Radio Repairman TK-87/U.	TM 11-5527...	Multimeter. Tool kit.

4-7. Resistance Measurements

Faulty antenna operation may be caused by an open transformer, indicator, capacitor, or switch, or a defective coaxial cable. Refer to paragraph 4-8.

4-8. Troubleshooting Chart

This troubleshooting chart is designed to supplement the operational checks detailed in paragraph 3-4b. If previous operational checks have resulted in reference to a particular item of this chart, go directly to the referenced item. If no operational symptoms are known, begin with the first item of that equipment performance checklist and proceed until the trouble is located.

Item	Indication	Probable trouble	Procedure
1	No output signal supplied to associated receiver.	a. Shorted or open coaxial cable ----- b. Defective ATTENUATOR switch. c. Defective attenuation pi-network circuit.	a. Make resistance check of cable; if shorted, replace cable. b. Clean and check continuity of switch A3S1 ; if defective, replace assembly A3 . Note. Assembly A3 includes switch and resistors (fig. 4-4). c. Check resistors R1 through R9 on assembly A3 ; if any resistor is defective, replace assembly
2	No output during 30-MHz operation.	Defective BANDSWITCH switch (A2S1).	Clean and make continuity check of A2S1 if switch is defective, replace assembly A2 . Note. Assembly A2 includes switch and circuit components (fig. 4-4).
3	No output during 40-MHz operation.	a. Defective switch A2S1 ----- b. Inductor A2L4 open or A2C4 shorted . . .	a. Check continuity of A2S1; if defective, replace assembly A2 . b. Make resistance check of A2 L4 and A2C4 . If defective, replace assembly A2 .
4	No output during 50-, 60-, or 70-MHz operation.	Defective inductor and/or capacitor on assembly A2 : L3 or C3 for 50-MHz operation, L2 or C2 for 60-MHz operation, L1 or C1 for 70-MHz operation.	Make resistance check of associated inductor and capacitor. If defective, replace assembly A2 .
5	Rotation of FINE TUNE control C1 causes noise in receiver.	Capacitor C1 plates bent (rub against each other), or shaft bearing is noisy.	Repair bent plates. If capacitor is defective, higher category repair is required. (Alinement of circuit is required if C1 is replaced.)

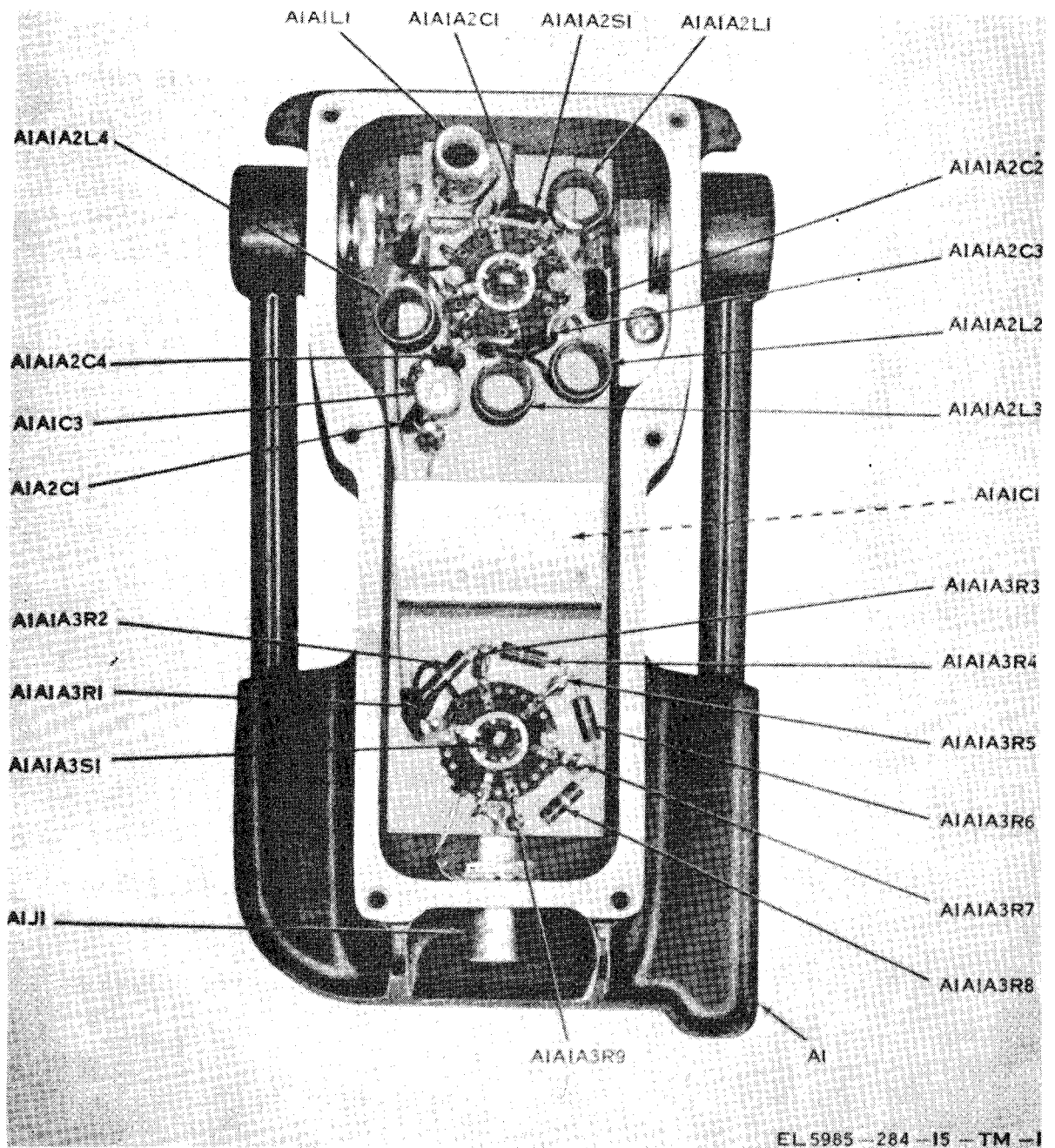


Figure 4-5. Antenna AT-1082/PRC (assembly A1), interior view.

4-9. Repairs

Most of the parts in Antenna AT-1082/PRC can be reached easily without special procedures. The repair duties of a direct support maintenance repairman are limited to the repair procedures listed below.

a. Removal and replacement of A1 chassis and components (para 4-10) .

b. Removal and replacement of loop antenna arms (para 4-11).

Caution: Be careful when handling inductors and rotor assemblies. Do not bend these parts.

4-10. Removal and Replacement of Chassis and Components

a. Removal (figs. 4-5 and 4-6).

- (1) Remove the six captive cover screws holding the cover to the case.
- (2) Loosen the three retaining screws on the three knobs; remove the knobs.
- (3) Unsolder the wire from connector J1 to the ATTENUATOR switch.
- (4) Remove the three hex nuts holding the control shafts in position.
- (5) Lift the chassis up and out of the case.
- (6) For the removal of switch assembly A1S1 or A2S1, capacitor C1, or connector J1, unsolder the connections, unscrew the associated shaft nut, and lift the released item up from the chassis.

b. Replacement.

- (1) Mount connector J1 to the case, and solder its ground connection.
- (2) Mount the switch assembly (A1S1 and/or A2S1) and capacitor C1 on the chassis, and screw on the associated shaft nut.
- (3) Place the chassis back in the case, and tighten the three hex nuts on the control shafts of A1S1, A2S1, and C1. Then, attach the switch knobs.
- (4) Install the six mounting screws for holding tile chassis to the case.
- (5) Solder the connections of the replaced items, and solder in capacitors C2 and C3, if required.
- (6) Solder the wire from ATTENUATOR switch A2S1 connector to J1.
- (7) Place the cover on the case, making sure that the rubber gasket is seated properly,

and tighten the cover down with the six captive screws.

4-11. Replacement of Loop Antenna Arms

To replace loop antenna arms, follow the procedures outlined in *a* and *b* below. For item numbers given in *a* and *b* below, refer to figure 4-6.

a. Removal. For removal of the loop antenna left side only (antenna coaxial arm assembly, item 4), omit the procedures in (5) below. All procedures listed are required for removal of both loop antenna sides (items 3 and 4). Item 3 (antenna arm assembly) is the loop antenna right side.

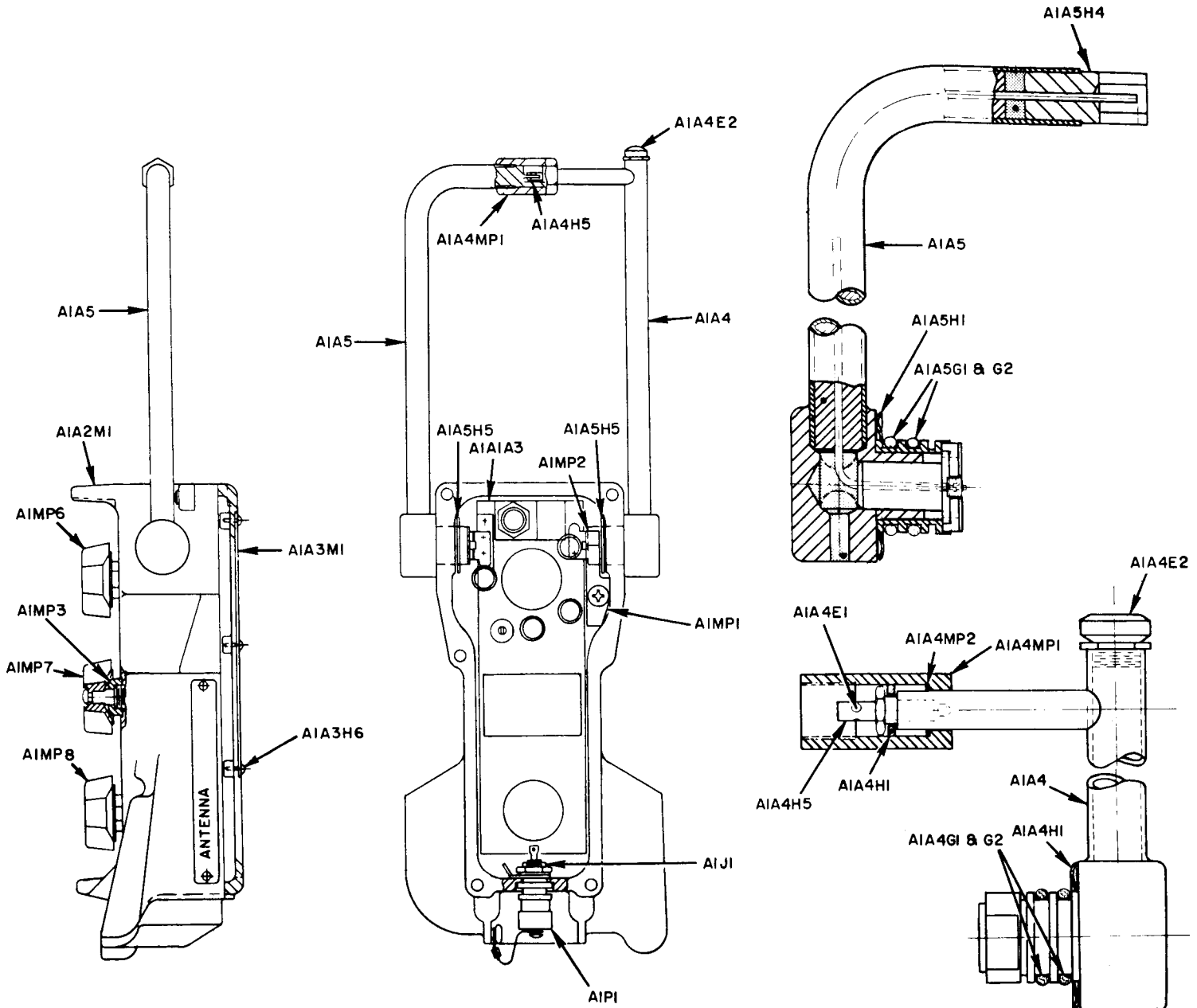
- (1) If possible, set the loop antenna into its operating position.
- (2) Unscrew the six cover screws, and remove the cover (1) from the case (2).
- (3) On the side of the loop antenna to be removed, antenna arm assembly (3) and/or antenna coaxial arm assembly (4), pull the E-ring (5) from its mounting.
- (4) Unscrew the coupling cap (6), and slide it to the sense whip antenna as far as possible.
- (5) For removal of antenna coaxial arm assembly (4), remove the leaf springs (7 and 8) that are mounted on the case.
- (6) Unsolder the tinned copper wire (9) from the contact plug (10). When heating contact plug (10), hold the soldering iron there and push the top portion of the antenna arm assembly (3 or 4) to be removed while having an assistant repairman press the contact point of that assembly from the case (2).

Caution: Once the tinned copper wire (9) has been removed from the contact plug (10), remove the soldering iron. This will prevent damage to either antenna arm assembly side (3 or 4) of the loop antenna.

- (7) After the desired antenna arm assembly (3 or 4) has been dismantled, remove O-rings (11) and spring washer (12) as required. If antenna coaxial arm assembly (4) has been dismantled, remove the nut from the contact plug (10), lock-washer (13), cent act plug (10), cap bearing (14), and coupling cap (6), as required.

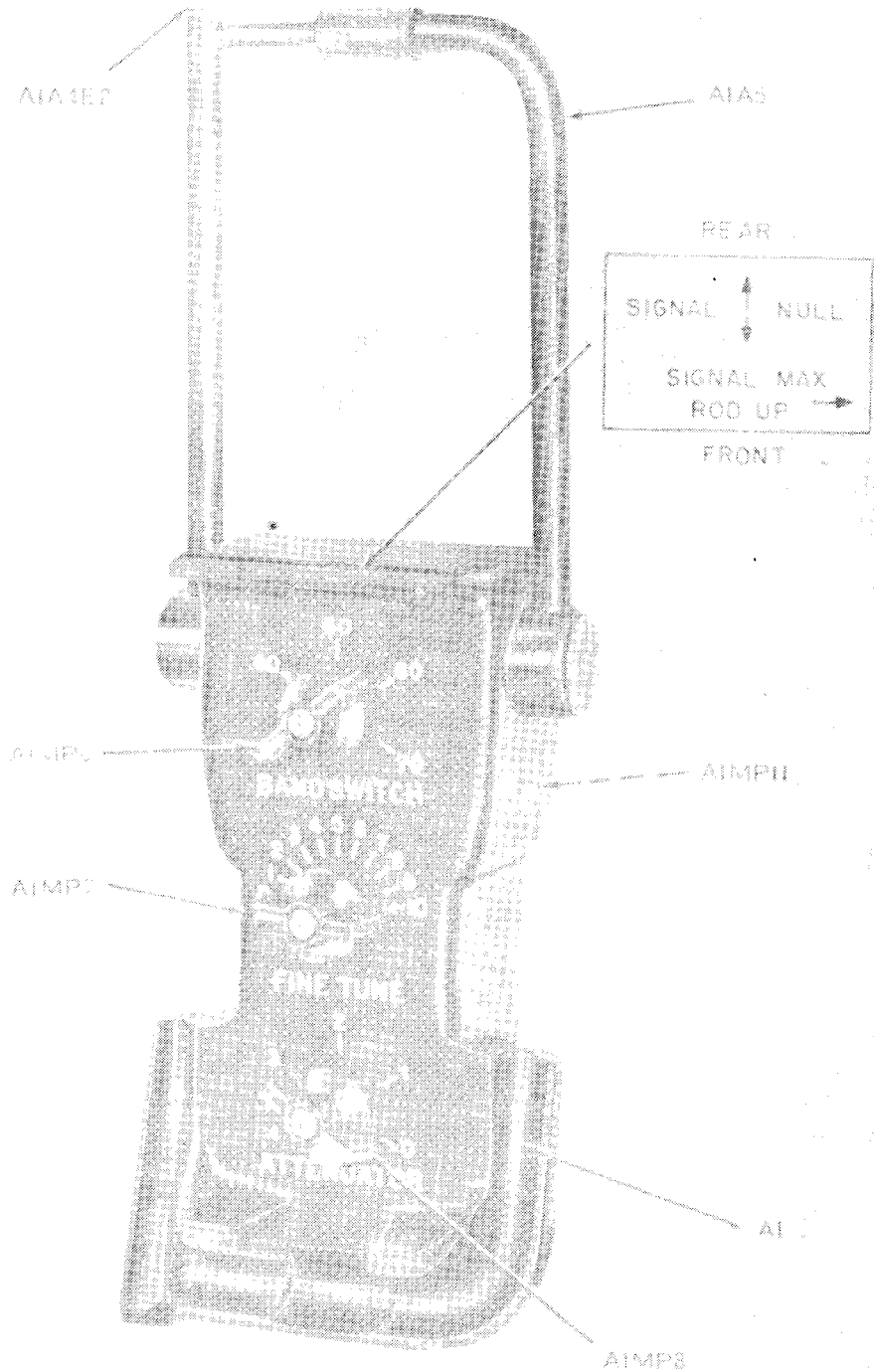
b. Replacement. For replacement of the antenna arm assembly (3) only, omit the procedures given in a(1), (4), and (8) below. All procedures are required for the replacement of a complete loop antenna.

- (1) For antenna coaxial arm assembly (4) replacement, apply glyptal compound (or equivalent) to the threads of the contact plug (10), screw the contact plug (10) in place on antenna coaxial arm assembly (4), slide on the coupling cap (6), insert the cap bearing (14) over the contact plug (10) into the coupling cap (6), place the lockwasher (13) on the contact plug (10), and screw on the nut for the contact plug (10).
- (2) For antenna arm assembly (3 or 4) replacement, apply a layer of silicone grease to the arm assembly surface which will meet the spring washer (12). Mount the spring washer (12) with the O-rings (11).
- (3) Set the case (2), with its cover (1) removed, in place for loop antenna mounting. (If either antenna arm assembly (3 or 4) has not been removed, raise that assembly to its operating position.) Cover the replaced O-rings (11) with a thin layer of silicone grease, and set the antenna arm assembly (3 or 4) in its operating position for mounting.
- (4) Insert the antenna arm assembly of one loop antenna side (3 or 4) into its mounting hole on proper side of the case (2).
- (5) Insert the base of that arm assembly (3 or 4) slightly into its associated mounting hole on the case (2), and check the alignment of the contact plug (10) with the tinned copper wire (9) which is contained in antenna arm assembly (3).
- (6) With the tinned copper wire (9) and the contact plug (10) in alignment, press the antenna arm assembly (3 or 4) that is being mounted, into the case (2).
- (7) Solder the tinned copper wire (9) and the contact plug (10). Slide the coupling cap (6) into position, and screw it to the other antenna arm assembly (4).
- (8) For the antenna coaxial arm assembly (4), insert E-ring (5) in place on the bottom of its antenna arm assembly. Place leaf springs (8) and (7) in position, and secure them to the case (2).
- (9) For the antenna arm assembly (3), insert E-ring (5) in place on the bottom of its antenna arm assembly.
- (10) Turn the case (2) over, and check to be sure that the loop antenna can be locked in its detented position and easily placed in its operating position.
- (11) Place the cover (1) on the case (2), making sure that the rubber gasket is seated properly, and tighten the cover (1) down with the six captive screws.



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Figure 4-6. Antenna A T-1082/PRC (assembly A1), location of removable parts.



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Figure 4-7. Antenna AT-1082/PRC, (assembly A1), front panel parts.

CHAPTER 5

GENERAL SUPPORT MAINTENANCE

Section I. REPAIR AND ALINEMENT

5-1. Repair

a. Maintenance of Antenna. AT-1082/PRC at general support level consists of replacing components on assemblies A2 and A3, performing the frequency range alinement (para 5-2), and performing the general support testing procedures (paras 5-3 through 5-8).

b. BANDSWITCH assembly A2 and ATTENUATOR switch assembly A3 each containing its switch and components (figs. 4-4 and 4-5), can be replaced or the assembly components can be replaced. Refer to paragraph 4-10 for removal and replacement procedures for the switch assemblies. To replace defective components on either switch assembly, unsolder the defective components and install their replacements.

- (1) After an inductor or capacitor on BANDSWITCH assembly A2 has been replaced, perform the alinement procedures given in paragraph 5-2 and then the performance procedure given in the chart below associated with the replaced component.

A2 Component	Performance procedure
L1, C1 (70 MHz)	Para 5-7, step No. 5.
L2, C2 (60 MHz)	Para 5-7, step No. 4.
L3, C3 (50 MHz)	Para 5-7, step No. 3.
L4, C4 (40 MHz)	Para 5-7, step No. 2.

- (2) After a resistor on ATTENUATOR switch assembly has been replaced, perform the testing procedures given in step 2, of paragraph 5-8c through h.

c. When capacitor C1 (FINE TUNE control), C2, or C3 (figs. 4-4 and 4-5) is replaced, perform the alinement procedures given in paragraph 5-2.

Also, if FINE TUNE is consistently beyond position 2 during range tests (para 5-7), perform the alinement procedures in para 5-2; then repeat para 5-7.

5-2. Frequency Range Alinement Procedures

a. *General.* The frequency range alinement procedures given in b below are performed when components of BANDSWITCH assembly (figs. 4-4 and 4-5) are replaced and when the performance standard given in the frequency range tests (para 5-7) is not within limits. The 30- and 39-MHz test frequencies are used as the test frequencies; other frequencies used in the operation of the AT-1082/PRC should pass through satisfactorily.

b. *Procedure.*

- (1) Perform the operations given in step No. 1, paragraph 5-7.
- (2) When the procedures given in step No. 1, paragraph 5-7 are completed, set the AT-1082/PRC controls as follows:
 - (a) ATTENUATOR: 0.
 - (b) FINE TUNE :0.
 - (c) BANDSWITCH :30.
- (3) Adjust the slug in coil L1 (fig. 4-5) to obtain a reading of 30 MHz on frequency Meter AN/URM-80.
- (4) Readjust Signal Generator AN/USM-44 for an output frequency of 39 MHz.
- (5) Set FINE TUNE control C1 on the AT-1082/PRC to 9.
- (6) Adjust capacitor C3 to obtain a reading of 39 MHz on the AN/URM-80.
- (7) Repeat the procedures in (3) above: re-adjust L1 if necessary.
- (8) Repeat the procedures in (4), (5), and (6) above; readjust C3 if necessary.
- (9) Turn off the power, and disconnect the equipment. (See para 5-1a(1); other procedures may be required.)

Section II. GENERAL SUPPORT TESTING PROCEDURES

5-3. General

a. Testing procedures are prepared for use by Electronics Field Maintenance Shops and Electronic Service Organizations responsible for general support maintenance of electronics equipment to determine the acceptability of repaired electronics equipment. These procedures set forth specific requirements that repaired electronics equipment *must* meet before it is returned to the using organization. The testing procedures may also be used as a guide for the testing of equipment that has been repaired at direct support level if the proper tools and test equipment are available.

b. Comply with the instructions preceding each chart before proceeding to the chart. Perform each test in sequence. *Do not vary the sequence.*

For each step, perform all the actions required in the *Test equipment control setting* and *Equipment under test control settings* columns; then perform each specific test procedure and verify it against its performance standard.

5-4. Test Equipment Required

All test equipment required to perform the testing procedures given in this section are listed in the following chart and are authorized under TA 11-17, and TA 11-100(11-17).

a. *Test Equipment.*

Nomenclature	Federal stock No.	Technical manual
Signal Generator AN/USM-44.	6625-669-0241	TM 11-6625-508-10.
Multimeter, ME-26A/U - - - - -	6625-360-2493	TM 11-6625-200-12.
Frequency Meter AN/URM-80.	6625-649-4286	TM 11-5095.
Resistor, carbon 47-ohm, 1/2-watt.	- - - - -	- - - - -
Radio Interference Measuring Set, AN/URM-85.	6625-776-0595	TM 11-6625-351-12.

b. *Other Equipment Required.* To conduct the frequency range test, construct a nonmetallic tri-

pod, 50 inches in height, with a nonmetallic disk sitting on top. This disk should be calibrated in 1° markings from 0° to 360° and be attached to a wooden handle (minimum of 36 inches long) which will be used to rotate the disk. The test antenna should then be mounted on top of the disk with provisions made for cable entry and a degree pointer. The pointer should be alined so that when the disk is rotated, the pointer will line up with the degree markings on the disk.

5-5. Test Conditions (fig. 5-1)

a. All tests shall be conducted in an open field which is free from all reflective objects.

b. Place Signal Generator AN/USM-44 on the ground with a 34-inch vertical antenna connected directly to the coaxial RF OUTPUT connector and terminated into a 47-ohm carbon resistor.

c. The signal generator should be placed on its back to enable the entire length of the antenna to extend (34 inches) above the signal generator top surface.

d. Set the output-of the signal generator to 0.5 volt with no modulation at each test frequency.

e. Place Frequency Meter AN/URM-80 on a table in a position as close as possible to the test antenna.

f. Place Antenna AT-1082/PRC on a tripod 50 inches high and centered over a 25-foot point of an imaginary line drawn between the signal generator and the AT-1082/PRC under test,

g. Connect the CG-3344/PRC 5-foot coaxial cable between the AT-1082/PRC and the frequency meter.

h. A power source of 110 to 120 volts, alternating current (ac), 60 Hertz (Hz) is required to provide operating voltages for test equipment listed in paragraph 5-4.

5-6. Physical Tests and Inspection

a. *Test Equipment and Material.* None.

b. *Test Connections and Conditions.* Remove cover from case.

c. Procedure.

Step No.	Test equipment settings	Equipment under test control settings	Test procedure	Performance standard
1	N/A___	Controls may be in any position.	a. Inspect all controls and mechanical assemblies for loose or missing screws. b. Inspect coaxial connector for looseness or damage.	a. Screws, bolts, and nuts will be tight; none missing. b. No looseness or damage evident.
2	N/A___	Controls may be in any position.	a. Rotate BANDSWITCH, ATTENUATOR, and FINE TUNE controls. Note. FINE TUNE control will rotate through 360°. b. Check to see that loop antenna extends and folds down and that detent mechanism locks antenna loop in place.	a. Controls will rotate freely without binding or excessive looseness. b. Loop antenna moves freely, without excessive binding.

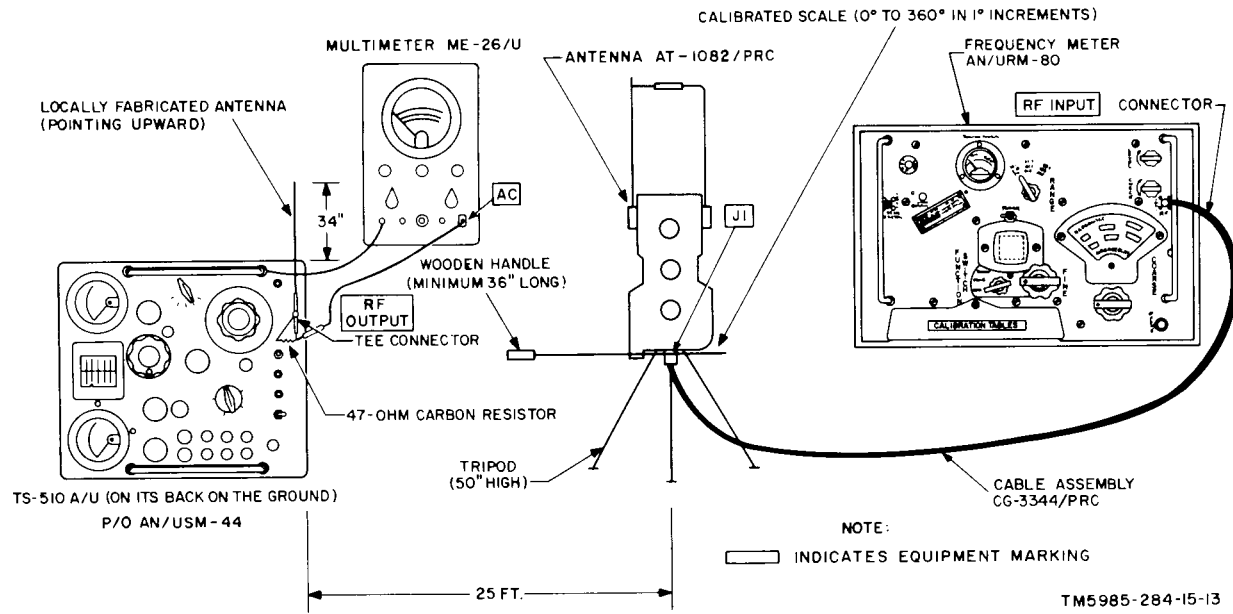


Figure 5-1. AT-1082/PRC, test setup for frequency range test.

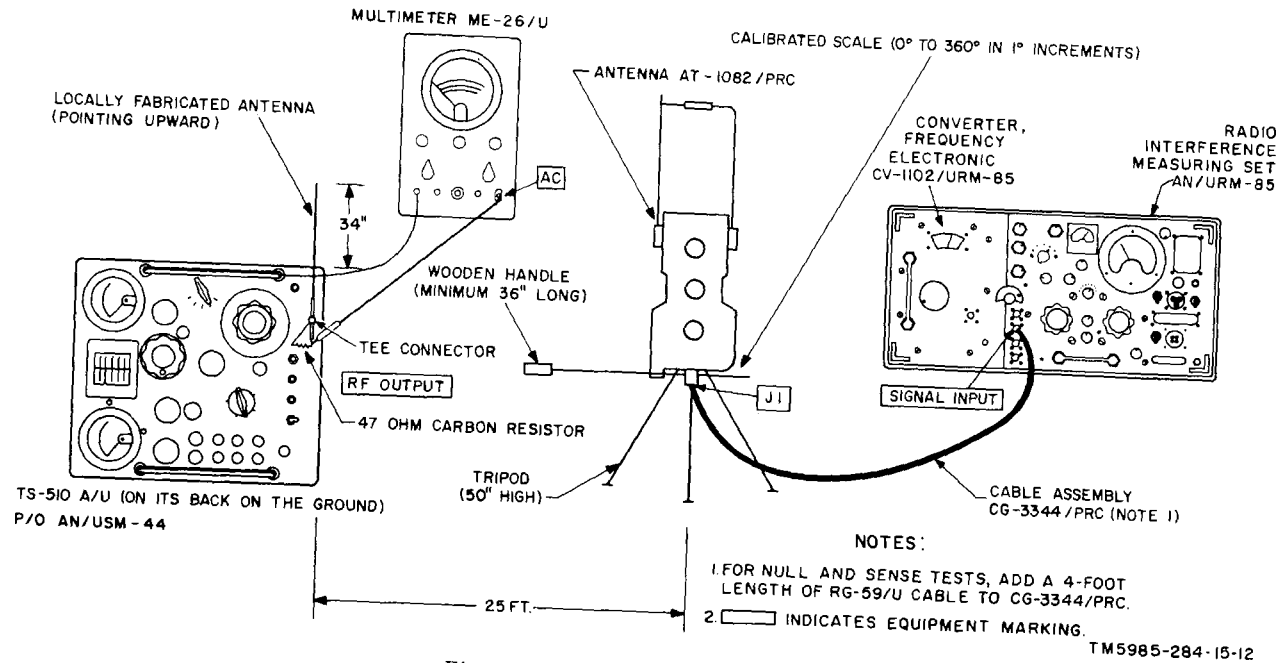


Figure 5-2. AT-1082/PRC, test setup.

5-7. Frequency Range Test

a. Test Equipment and Materials.

- (1) Signal Generator AN/USM-44 (includes Signal Generator TS-510A/U).
- (2) Frequency Meter AN/URM-80.
- (3) Multimeter ME-26A/U.
- (4) Resistor, carbon, 47-ohm, 1/4-watt.

b. Test Connections and Conditions.

- (1) Test must be conducted in an open field which is free from reflective objects.
- (2) Connect the equipment as shown in figure 5-1, and paragraph 5-5 with the signal generator on its back to allow the entire length of the vertical antenna (34 inches) to be above the signal generator top surface. Distance between the signal generator and the AT-1082/PRC under test should be 25 feet. Place Frequency Meter AN/URM-80 on a table behind the AT-1082/PRC under test. Turn on the test equipment, and allow a 5-minute warmup period.

c. Procedure. If the FINE TUNE control is consistently beyond 2 in the performance standard, perform the frequency range alignment (para 5-2).

Step No.	Test equipment control settings	Equipment under test control settings	Test procedure	Performance standard
1	<p><i>TS-510A/U</i></p> <p>MOD SELECTOR: CW. OUTPUT LEVEL: Adjust for reading of SET LEVEL on OUTPUT VOLTS meter. FREQUENCY RANGE: B. MEGACYCLES indicator: 30 on B-scale (use FREQ adjusting knob). OUTPUT LEVEL: Adjust for reading of SET LEVEL on OUTPUT VOLTS meter. AMP TRIMMER: Adjust for maximum reading on OUTPUT VOLTS meter. OUTPUT LEVEL: Adjust for reading of SET LEVEL on OUTPUT VOLTS meter.</p> <p><i>ME-26A/U</i></p> <p>RANGE: IV.</p> <p><i>TS-510A/U</i></p> <p>ATTENUATOR: Adjust for 0.5v-indication on <i>ME-26A/U</i>.</p> <p><i>AN/URM-80</i></p> <p>RANGE: 21.7-46.7 MHz. LEVEL: Fully clockwise. FUNCTION SWITCH: COARSE. COARSE: Adjust until audio tone is heard.</p> <p>LEVEL: Adjust until needle on TUNING meter is in the green LEVEL SET area. FUNCTION SWITCH: FINE.</p> <p>FUNCTION SWITCH: CHECK.</p> <p>FUNCTION SWITCH: FINE.</p> <p>CALIBRATION TABLES: Turn to section the same color as the COARSE tuning dial. PG: Turn to page number indicated in window.</p>	<p>BANDSWITCH: 30. ATTENUATOR: 0. FINE TUNE: 0.</p> <p>Adjust FINE TUNE control until maximum audio tone is heard.</p>	<p>Tune for zero beat. <i>Note.</i> Hairline on HARMONICS window of COARSE tuning dial falls on numbered black rectangle. If not, readjust FINE tuning control till hairline falls on numbered black rectangle. Adjust until nearest black diamond mark is lined up with hairline in the FINE tuning window under CH'K. Adjust for zero beat. Adjust until no tone is heard. <i>Note.</i> TUNING meter goes to zero.</p> <p>Read the BASIC FREQ in the FINE tuning window, and locate this number in the column of the CALIBRATION TABLES BASIC FREQ. Read on COARSE tuning dial the number to be used, and locate it in the HARMONICS column in the tables. At the intersection of the line containing BASIC FREQ and the HARMONICS column, read the frequency. This is the frequency being measured. Record this data.</p>	<p>30 ± 2 MHz; FINE TUNE control on AT-1082/PRC is set between 0 and 2.</p>
2	<p><i>TS-510A/U</i></p> <p>MOD SELECTOR: CW. OUTPUT LEVEL: Adjust for reading of SET LEVEL on OUTPUT VOLTS meter. FREQUENCY RANGE: B. MEGACYCLES indicator: 40 on B-scale (use FREQ adjusting knob). OUTPUT LEVEL: Adjust for reading of SET LEVEL on OUTPUT VOLTS meter. AMP TRIMMER: Adjust for maximum reading on OUTPUT VOLTS meter. OUTPUT LEVEL: Adjust for reading of SET LEVEL on OUTPUT VOLTS meter.</p> <p><i>ME-26A/U</i></p> <p>RANGE: IV.</p> <p><i>TS-510A/U</i></p> <p>ATTENUATOR: Adjust for 0.5v-indication on <i>ME-26A/U</i>.</p> <p><i>AN/URM-80</i></p> <p>RANGE: 21.7-46.7 MHz. LEVEL: Fully clockwise. FUNCTION SWITCH: COARSE. COARSE: Adjust until audio tone is heard.</p> <p>LEVEL: Adjust until needle on TUNING meter is in the green LEVEL SET area. FUNCTION SWITCH: FINE.</p> <p>FUNCTION SWITCH: CHECK.</p> <p>FUNCTION SWITCH: FINE.</p> <p>CALIBRATION TABLES: Turn to section the same color as the COARSE tuning dial. PG: Turn to page number indicated in window.</p>	<p>BANDSWITCH: 40. ATTENUATOR: 0. FINE TUNE: 0.</p> <p>Adjust FINE TUNE control until maximum audio tone is heard.</p> <p>Tune for zero beat. <i>Note.</i> Hairline on HARMONICS window of COARSE tuning dial falls on numbered black rectangle. If not, read only FINE tuning control till hairline falls on numbered black rectangle. Adjust until nearest black diamond mark is lined up with hairline in the FINE tuning window under CH'K. Adjust for zero beat.</p>	<p>Adjust until no tone is heard. <i>Note.</i> TUNING meter goes to zero.</p> <p>Read the BASIC FREQ in the FINE tuning window, and locate this number in the column of the CALIBRATION TABLES BASIC FREQ. Read on COARSE tuning dial the number to be used, and locate it in the HARMONICS column in the tables. At the intersection of the line containing BASIC FREQ and the HARMONICS column, read the frequency. This is the frequency being measured. Record this data.</p>	<p>40 ± 2 MHz; FINE TUNE control on AT-1082/PRC is set between 0 and 2.</p>

5-8. Sensitivity, Attenuation, Null, and Sense Tests

a. Test Equipment and Materials.

- (1) Signal Generator AN/USM-44 (includes Signal Generator TS-510/U).
- (2) Radio Interference Measuring Set AN/URM-85 (includes Converter, Frequency Electronic CV-1102/URM-85).
- (3) Resistor, 47 ohms, 1/2 watt.
- (4) Multimeter ME-26A/U.
- (5) Cable Assembly, Radio Frequency CG-3344/PRC.
- (6) Four foot length of Cable type RG-58/U.
- (7) Tripod, 50 inches high, with calibrated scale (para 5-4b).

b. Test Connections and Conditions. Use the test conditions described in paragraph 5-5 and connect the equipment as shown in figure 5-2. **In step 2 of all tests (subpara c through g), the distance is reduced to 11 feet.**

c. Procedure for 30-MHz Tests.

Step No.	Test equipment control settings	Equipment under test control settings	Test procedure	Performance standard
1	<p>Sensitivity test: TS-510A/U (P/O AN/USM-44)</p> <p>Power switch: ON. MOD SELECTOR: CW. FREQUENCY RANGE: B. MEGACYCLES indicator: 30 on B-scale with FREQ adjusting knob. OUTPUT LEVEL control to SET LEVEL as indicated by red arrow on OUTPUT VOLTS meter. Adjust AMP TRIMMER for maximum reading on OUTPUT VOLTS meter. Adjust OUTPUT LEVEL for a reading of SET LEVEL on OUTPUT VOLTS meter.</p> <p style="text-align: center;"><i>ME-26A/U</i></p> <p>Monitor signal generator output level, and adjust ATTENUATOR on TS-510A/U for 1 v-indications on ME-26A/U.</p> <p style="text-align: center;"><i>AN/URM-85</i></p> <p>Power switch: ON. Adjust ZERO ADJ. until meter pointer is at 0 on the MICROVOLTS SCALE. Function switch: PULSE PEAK. MEGACYCLES control on CV-1102/URM-85 to 30 mc. Set impulse generator coarse control to 60 and the fine control 0. ON-OFF switch: QN. GAIN control: for full scale meter reading. Impulse generator ON-OFF switch: OFF. (The AN/URM-85 is now calibrated so that full scale deflection is equal to 100 microvolts.) Calibration Switch: SERIES CAL & OPERATE. Function switch: CW AVERAGE. (If meter pointer goes off-scale during the tests, set the SIGNAL ATTENUATOR DB control to higher steps, such as 40, 60, and 80.) FINE TUNE: Maximum deflection on the AN/URM-85.</p>	<p>BANDSWITCH: 30. ATTENUATOR: 0. FINE TUNE: 0.</p> <p>(Make sure sense whip antenna is depressed.)</p>	<p>Turn antenna until maximum signal is indicated on AN/URM-85.</p>	<p>Minimum acceptable sensitivity is 100 microvolts.</p>
2	<p>Attenuation test</p> <p>Settings unchanged from step No. 1.</p>	<p>Settings unchanged from step No. 1.</p>	<p>a. Change distance from 25 to 11 ft. Turn antenna until maximum signal is indicated on AN/URM-85 and record reading (reference). b. Rotate the AT-1082/PRC ATTENUATOR knob from 0 to 1 (10 db). The reading recorded in a above should be 10 db lower. c. Rotate the AT-1082/PRC ATTENUATOR knob from 1 to 2 (20 db). The reading recorded in a above should be 20 db lower. d. Rotate the AT-1082/PRC ATTENUATOR knob from 2 to 3 (30 db). The reading recorded in a above should be 30 db lower. e. Rotate the AT-1082/PRC ATTENUATOR knob from 3 to 4 (36 db). f. Restore distance to 25 ft.</p>	<p>a. None. b. 10 \pm 2 db. c. 10 \pm 2 db. d. 10 \pm 2 db. e. At least 5 db more than d above. f. None</p>
3	<p>Null test</p> <p>Settings unchanged from step No. 2.</p>	<p>Settings unchanged from step No. 2, except: ATTENUATOR: 0.</p>	<p>a. Make sure sense whip antenna is depressed. Add a 4-foot length of RG-58/U coaxial cable to the CG-3344/PRC. b. Rotate the AT-1082/PRC on tripod till the sense arrow on the antenna case points to the signal generator antenna. c. Rotate the AT-1082/PRC until a peak reading is obtained on the DECIBEL meter on the AN/URM-85. Record this reading. d. Rotate the AT-1082/PRC 180°, and find another peak signal reading. Record this reading. e. Rotate the AT-1082/PRC 90° (broadside to the signal generator), and obtain a null reading. Record this reading. f. Rotate the AT-1082/PRC 180°, and obtain another null reading. Record this reading. g. Subtract the larger of the two null readings from the smaller of the two peak readings.</p>	<p>a. None. b. None. c. None. d. None. e. None. f. None. g. A 20-db difference should be obtained.</p>
4	<p>Sense test</p> <p>Controls unchanged from step No. 3.</p>	<p>Controls unchanged from step No. 3.</p>	<p>a. Extend the sense whip antenna. b. Remove the AT-1082/PRC from tripod. Holding the AT-1082/PRC at a distance of 25 feet from the signal generator and at a height of 6 feet, point the sense arrow on the antenna case to signal generator antenna. Note and record the reading indicated on the AN/URM-85. c. Rotate the AT-1082/PRC 180°. Note and record the reading. d. Compare the reading taken in b and c above. e. Disconnect the 4-foot length of RG-58/U cable, and reconnect the CG-3344/PRC between the AT-1082/PRC and the AN/URM-85. Proceed to check 40-MHz operation (d below).</p>	<p>a. None. b. None. c. None. d. A separation of 6 db is acceptable. e. None.</p>

Step No.	Test equipment control settings	Equipment under test control settings	Test procedure	Performance standard
3	<p>TS-510A/U</p> <p>MOD SELECTOR: CW. OUTPUT LEVEL: Adjust for reading of SET LEVEL on OUTPUT VOLTS meter. FREQUENCY RANGE: B. MEGACYCLES indicator: 50 on C-scale (use FREQ adjusting knob). OUTPUT LEVEL: Adjust for reading of SET LEVEL on OUTPUT VOLTS meter. AMP TRIMMER: Adjust for maximum reading on OUTPUT VOLTS meter. OUTPUT LEVEL: Adjust for reading of SET LEVEL on OUTPUT VOLTS meter.</p> <p>ME-26A/U RANGE: IV. TS-510A/U</p> <p>ATTENUATOR: Adjust for 0.5v-indication on ME-26A/U. AN/URM-80</p> <p>RANGE: 21.7-46.7 MHz. LEVEL: Fully clockwise. FUNCTION SWITCH: COARSE. COARSE: Adjust until audio tone is heard.</p> <p>LEVEL: Adjust until needle on TUNING meter is in the green LEVEL SET area. FUNCTION SWITCH: FINE.</p> <p>FUNCTION SWITCH: CHECK.</p> <p>FUNCTION SWITCH: FINE.</p> <p>CALIBRATION TABLES: Turn to section the same color as the COARSE tuning dial. PG: Turn to page number indicated in window.</p>	<p>BANDSWITCH: 50. ATTENUATOR: 0. FINE TUNE: 0.</p> <p>Adjust FINE TUNE control until maximum audio tone is heard.</p>	<p>Tune for zero beat. Note: Hairline on HARMONICS window of COARSE tuning dial falls on numbered black rectangle. If not, read only FINE tuning control till hairline falls on numbered black rectangle. Adjust until nearest black diamond mark is lined up with hairline in the FINE tuning window under CH'K. Adjust for zero beat. Adjust until no tone is heard. Note: TUNING meter goes to zero.</p> <p>Read the BASIC FREQ in the FINE tuning window and locate this number in the column of the CALIBRATION TABLES BASIC FREQ. Read on COARSE tuning dial the number to be used, and locate it in the HARMONICS column in the tables. At the intersection of the line containing BASIC FREQ. and the HARMONICS column, read the frequency. This is the frequency being measured. Record this data.</p>	<p>50 ± 2 MHz; FINE TUNE control is set between 0 and 2.</p>
4	<p>TS-510A/U</p> <p>MOD SELECTOR: CW. OUTPUT LEVEL: Adjust for reading of SET LEVEL on OUTPUT VOLTS meter. FREQUENCY RANGE: B. MEGACYCLES indicator: 60 on B-scale (use FREQ adjusting knob). OUTPUT LEVEL: Adjust for reading of SET LEVEL on OUTPUT VOLTS meter. AMP TRIMMER: Adjust for maximum reading on OUTPUT VOLTS meter. OUTPUT LEVEL: Adjust for reading of SET LEVEL on OUTPUT VOLTS meter.</p> <p>ME-26A/U RANGE: IV. TS-510A/U</p> <p>ATTENUATOR: Adjust for 0.5 v-indication on ME-26A/U. AN/URM-80</p> <p>RANGE: 46.7-100 MHz. LEVEL: Fully clockwise. FUNCTION SWITCH: COARSE. COARSE: Adjust until audio tone is heard.</p> <p>LEVEL: Adjust until needle on TUNING meter is in the green LEVEL SET area. FUNCTION SWITCH: FINE.</p> <p>FUNCTION SWITCH: CHECK.</p> <p>FUNCTION SWITCH: FINE.</p> <p>CALIBRATION TABLES: Turn to section the same color as the COARSE tuning dial. PG: Turn to page number indicated in window.</p>	<p>BANDSWITCH: 60. ATTENUATOR: 0. FINE TUNE: 0.</p> <p>Adjust FINE TUNE control until maximum audio tone is heard.</p>	<p>Tune for zero beat. Note: Hairline on HARMONICS window of COARSE tuning dial falls on numbered black rectangle. If not, readjust FINE tuning control till hairline falls on numbered black rectangle. Adjust until nearest black diamond mark is lined up with hairline in the FINE tuning window under CH'K. Adjust for zero beat. Adjust until no tone is heard. Note: TUNING meter goes to zero.</p> <p>Read the BASIC FREQ in the FINE tuning window and locate this number in the column of the CALIBRATION TABLES BASIC FREQ. Read on COARSE tuning dial the number to be used, and locate it in the HARMONICS column in the tables. At the intersection of the line containing BASIC FREQ and the HARMONICS column, read the frequency. This is the frequency being measured. Record this data.</p>	<p>60 ± 2 MHz, and FINE TUNE control is set between 0 and 2.</p>

Step No.	Test equipment control settings	Equipment under test control settings	Test procedure	Performance standard
5	<p><i>TS-510A/U</i></p> <p>MOD SELECTOR: CW. OUTPUT LEVEL: Adjust for reading of SET LEVEL on OUTPUT VOLTS meter. FREQUENCY RANGE: B. MEGACYCLES indicator: 70 on B-scale (use FREQ adjusting knob). OUTPUT LEVEL: Adjust for reading of SET LEVEL on OUTPUT VOLTS meter. AMP TRIMMER: Adjust for maximum reading on OUTPUT VOLTS meter. OUTPUT LEVEL: Adjust for reading of SET LEVEL on OUTPUT VOLTS meter.</p> <p><i>ME-26A/U</i> RANGE: IV. <i>TS-510A/U</i></p> <p>ATTENUATOR: Adjust for 0.5v-indication on ME-26A/U. <i>AN/URM-80</i></p> <p>RANGE: 46.7-100 MHz. LEVEL: Fully clockwise. FUNCTION SWITCH: COARSE. COARSE: Adjust until audio tone is heard.....</p> <p>LEVEL: Adjust until needle on TUNING meter is in green LEVEL SET area. FUNCTION SWITCH: FINE.....</p> <p>FUNCTION SWITCH: FINE.....</p> <p>FUNCTION SWITCH: FINE.....</p> <p>CALIBRATION TABLES: Turn to section the same color as the COARSE tuning dial. PG: Turn to page number indicated in window.....</p>	<p>BANDSWITCH: 70. ATTENUATOR: 0.</p> <p>Adjust FINE TUNE control until audio tone is heard.</p>	<p>Tune for zero beat. <i>Note.</i> Hairline on HARMONICS window of COARSE tuning dial falls on numbered black rectangle. If not, read only FINE tuning control till hairline falls on numbered black rectangle.</p> <p>Adjust until nearest black diamond mark is lined up with hairline in the FINE tuning window under 'CH'K'. Adjust for zero beat. Adjust until no tune is heard. <i>Note.</i> TUNING meter goes to zero.</p> <p>Read the BASIC FREQ in the FINE tuning window, and locate this number in the column of the CALIBRATION TABLES BASIC FREQ. Read on COARSE tuning dial the number to be used, and locate it in the HARMONICS column in the tables. At the intersection of the line containing BASIC FREQ and the HARMONICS column, read the frequency. This is the frequency being measured. Record this data.</p>	<p>70 ± 2 MHz; FINE TUNE control is set between 0 and 2.</p>
6	<p><i>TS-510A/U</i></p> <p>MOD SELECTOR: CW. OUTPUT LEVEL: Adjust for reading of SET LEVEL on OUTPUT VOLTS meter. FREQUENCY RANGE: B. MEGACYCLES indicator: 76 on B-scale (use FREQ adjusting knob). OUTPUT LEVEL: Adjust for reading of SET LEVEL on OUTPUT VOLTS meter. AMP TRIMMER: Adjust for maximum reading on OUTPUT VOLTS meter. OUTPUT LEVEL: Adjust for reading of SET LEVEL on OUTPUT VOLTS meter.</p> <p><i>ME-26A/U</i> RANGE: IV. <i>TS-510A/U</i></p> <p>ATTENUATOR: Adjust for 0.5v-indication on ME-26A/U. <i>AN/URM-80</i></p> <p>RANGE: 46.7-100 MHz. LEVEL: Fully clockwise. FUNCTION SWITCH: COARSE. COARSE: Adjust until audio tone is heard.</p> <p>LEVEL: Adjust until needle on TUNING meter is in the green LEVEL SET area. FUNCTION SWITCH.....</p> <p>FUNCTION SWITCH: CHECK.....</p> <p>FUNCTION SWITCH: FINE.....</p> <p>CALIBRATION TABLES: Turn to section the same color as the COARSE tuning dial. PG: Turn to page number indicated in window.....</p>	<p>BANDSWITCH: 70. ATTENUATOR: 0. FINE TUNE: 6.</p> <p>Adjust FINE TUNE control until maximum audio tone is heard.</p>	<p>Tune for zero beat. <i>Note.</i> Hairline on HARMONICS window of COARSE tuning dial falls on numbered black rectangle. If not, read only FINE tuning control till hairline falls on numbered black rectangle.</p> <p>Adjust until nearest black diamond mark is lined up with hairline in the FINE tuning window under 'CH'K'. Adjust for zero beat. Adjust until no tone is heard. <i>Note.</i> TUNING meter goes to zero.</p> <p>Read the BASIC FREQ in the FINE tuning window, and locate this number in the column of the CALIBRATION TABLES BASIC FREQ. Read on COARSE tuning dial the number to be used, and locate it in the HARMONICS column in the tables. At the intersection of the line containing BASIC FREQ and the HARMONICS column, read the frequency. This is the frequency being measured. Record this data.</p>	<p>76.0 MHz, and the FINE TUNE control is set on 6 ± 2.</p>

d. Procedure for 40-MHz Tests.

Test equipment control settings	Equipment under test control settings	Test procedure	Performance standard
<p><i>Sensitivity test: TS-510A/U (P/O AN/USM-44)</i></p> <p>Power switch: ON. MOD SELECTOR: CW. FREQUENCY RANGE: B. MEGACYCLES indicator: 40 on B-scale with FREQ adjusting knob. OUTPUT LEVEL control: SET LEVEL as indicated by red arrow on OUTPUT VOLTS meter. Adjust AMP TRIMMER for maximum reading on OUTPUT VOLTS meter. Adjust OUTPUT LEVEL for a reading of SET LEVEL on OUTPUT VOLTS meter.</p> <p style="text-align: center;"><i>ME-26A/U</i></p> <p>Monitor signal generator output level, and adjust ATTENUATOR on TS-510A/U for 1v-indication on ME-26A/U.</p> <p style="text-align: center;"><i>AN/URM-85</i></p> <p>Power switch: ON. Adjust ZERO ADJ. until meter pointer is at 0 on the MICROVOLTS SCALE. Function switch: PULSE PEAK. MEGACYCLES control on CV-1102/URM-85 to 40 mc. Set impulse generator coarse control to 60 and the fine control to 0. ON-OFF switch: ON. GAIN control: for full scale meter reading. Impulse generator ON-OFF switch: OFF. The AN/URM-85 is now calibrated so that full scale deflection is equal to 100 microvolts. Calibration switch: SERIES CAL & OPERATE. Function switch: CW AVERAGE. If meter pointer goes off-scale during the tests, set the SIGNAL ATTENUATOR DB control to higher steps, such as 40, 60 and 80 FINE TUNE: Maximum deflection on the AN/URM-85</p>	<p>BANDSWITCH: 40. ATTENUATOR: 0. FINE TUNE: 0. (Make sure sense whip antenna is depressed.)</p>	<p>Turn the AT-1082/PRC until maximum signal is indicated on the AN/URM-85.</p>	<p>Minimum acceptable sensitivity is 190 microvolts.</p>

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e. Procedure for 50-MHz Tests.

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Change 5

Test equipment control settings	Equipment under test control settings	Test procedure	Performance standard
<p><i>Sensitivity test TS-510A/U (P/O AN/USM-44)</i></p> <p>Power switch: ON. MOD SELECTOR: CW. FREQUENCY RANGE: C. MEGACYCLES indicator: 50 on C-scale with FREQUENCY adjusting knob. OUTPUT LEVEL control to SET LEVEL as indicated by red arrow on OUTPUT VOLTS meter. Adjust AMP TRIMMER for maximum reading on OUTPUT VOLTS meter. Adjust OUTPUT LEVEL for a reading of SET LEVEL on OUTPUT VOLTS meter.</p> <p style="text-align: center;"><i>ME-26A/U</i></p> <p>Monitor signal generator output level, and adjust ATTENUATOR on TS-510A/U for 1-v indication on ME-26A/U.</p> <p style="text-align: center;"><i>AN/URM-85</i></p> <p>Power switch: ON. Adjust ZERO ADJ. until meter pointer is at 0 on the MICROVOLTS scale. Function switch: PULSE PEAK. MEGACYCLES control on CV-1102/URM-85 to 50 mc. Set impulse generator coarse control to 60 and the fine control 0. ON-OFF switch: ON. GAIN control: For full scale meter reading. Impulse generator ON-OFF switch: OFF. (The AN/URM-85 is now calibrated so that full scale deflection is equal to 100 microvolts.) Calibration switch: SERIES CAL & OPERATE. Function switch: CW AVERAGE. If meter pointer goes off-scale during the tests, set the SIGNAL ATTENUATOR DB control to higher steps, such as 40, 60, and 80. FINE TUNE: maximum deflection on the AN/URM-85.</p>	<p>BANDSWITCH: 50. ATTENUATOR: 0. FINE TUNE: 0. Make sure sense whip antenna is depressed.</p>	<p>Turn the AT-1082/PRC until maximum signal is indicated on the AN/URM-85.</p>	<p>Minimum acceptable sensitivity is 310 microvolts.</p>

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f. Procedure for 60-MHz Tests.

Test equipment control settings	Equipment under test control settings	Test procedure	Performance standard
<p><i>Sensitivity test: TS-510A/U</i></p> <p>Power switch: ON. MOD SELECTOR: CW. FREQUENCY RANGE: C. MEGACYCLES indicator: 60 on C-scale with FREQUENCY adjusting knob. OUTPUT LEVEL control to SET LEVEL as indicated by red arrow on OUTPUT VOLTS meter. Adjust AMP TRIMMER for maximum reading on OUTPUT VOLTS meter. Adjust OUTPUT LEVEL for a reading of SET LEVEL on OUTPUT VOLTS meter.</p> <p><i>ME-26A/U</i></p> <p>Monitor signal generator output level, and adjust ATTENUATOR on TS-510A/U for 1 v-indication on ME-26A/U.</p> <p><i>AN/URM-85</i></p> <p>Power switch: ON. Adjust ZERO ADJ. until meter pointer is at 0 on the MICROVOLTS scale. Function switch: PULSE PEAK. MEGACYCLES control on CV-1102/URM-85 to 60 mc. Set impulse generator coarse control to 60 and the fine control 0. ON-OFF switch: ON. GAIN control: For full scale meter reading. Impulse generator ON-OFF switch: OFF. The AN/URM-85 is now calibrated so that full scale deflection is equal to 100 microvolts. Calibration switch: SERIES CAL & OPERATE. Function switch: CW AVERAGE. If meter pointer goes off-scale during the tests, set the SIGNAL ATTENUATOR DB control to higher steps, such as 40, 60, and 80. FINE TUNE: Maximum deflection on the AN/URM-85.</p>	<p>BANDSWITCH: 60. ATTENUATOR: 0. FINE TUNE: 0. Make sure sense whip antenna is depressed.</p>	<p>Turn the AT-1082/PRC until maximum signal is indicated on the AN/URM-85.</p>	<p>Minimum acceptable sensitivity is 520 microvolts.</p>

g. Procedure for 70-MHz Tests.

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Test equipment control settings	Equipment under test control settings	Test procedure	Performance standard
<p style="text-align: center;"><i>Sensitivity test: TS-510A/U</i></p> <p>Power switch: ON. MOD SELECTOR: CW. FREQUENCY RANGE: C. MEGACYCLES indicator: 70 on C-scale with FREQUENCY adjusting knob OUTPUT LEVEL control to SET LEVEL as indicated by red arrow on OUTPUT VOLTS meter. Adjust AMP TRIMMER for maximum reading on OUTPUT VOLTS meter. Adjust OUTPUT LEVEL for a reading of SET LEVEL on OUTPUT VOLTS meter.</p> <p style="text-align: center;"><i>ME-26A/U</i></p> <p>Monitor signal generator output lever, and adjust ATTENUATOR on TS-510A/U for 1 v-indication on ME-26A/U.</p> <p style="text-align: center;"><i>AN/URM-85</i></p> <p>Power switch: ON. Adjust ZERO ADJ. until meter pointer is at 0 on the MICROVOLTS scale. Function switch: PULSE PEAK. MEGACYCLES control on CV-1102/URM-85 to 70 mc. Set impulse generator coarse control to 60 and the fine control 0. ON-OFF switch: ON. GAIN control: For full scale meter reading. Impulse generator ON-OFF switch: OFF. The AN/URM-85 is now calibrated so that full scale deflection is equal to 100 microvolts. Calibration switch: SERIES CAL & OPERATE. Function switch: CW AVERAGE. If meter pointer goes off-scale during the tests, set the SIGNAL ATTENUATOR DB control to higher steps, such as 40, 60, and 80. FINE TUNE: Maximum deflection on AN/URM-85.</p>	<p>BANDSWITCH: 70. ATTENUATOR: 0. FINE TUNE: 0. Make sure sense whip antenna is depressed.</p>	<p>Turn antenna until maximum signal is indicated on AN/URM-85.</p>	<p>Minimum acceptable sensitivity is 710 microvolts.</p>

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h. Procedure for 76-MHz Tests.

Test equipment control settings	Equipment under test control settings	Test procedure	Performance standard
<p><i>Sensitivity test: TS-510A/U</i></p> <p>Power switch: ON. MOD SELECTOR: CW. FREQUENCY RANGE: C. MEGACYCLES indicator: 76.0 on C-scale with FREQUENCY adjusting knob. OUTPUT LEVEL control to SET LEVEL as indicated by red arrow on OUTPUT VOLTS meter. Adjust AMP TRIMMER for maximum reading on OUTPUT VOLTS meter. Adjust OUTPUT LEVEL for a reading of SET LEVEL on OUTPUT VOLTS meter.</p> <p><i>ME-26A/U</i></p> <p>Monitor signal generator output level, and adjust ATTENUATOR on TS-510A/U for 1 v-indication on ME-26A/U.</p> <p><i>AN/URM-85</i></p> <p>Power switch: ON. Adjust ZERO ADJ. until meter pointer is at 0 on the MICROVOLTS scale. Function switch: PULSE PEAK. MEGACYCLES control on CV-1102/URM-85 to 76.0 mc. Set impulse generator coarse control to 60 and the fine control 0. ON-OFF switch: ON. GAIN control: For full scale meter reading. Impulse generator ON-OFF switch: OFF. The AN/URM-85 is now calibrated so that full scale deflection is equal to 100 microvolts. Calibration switch: SERIES CAL & OPERATE. Function switch: CW AVERAGE. If meter pointer goes off-scale during the tests, set the SIGNAL ATTENUATOR DB control to higher steps, such as 40, 60 and 80. FINE TUNE: Maximum deflection on AN/URM-85.</p>	<p>BANDSWITCH: 70. ATTENUATOR: 0. FINE TUNE: 6. Make sure sense whip antenna is depressed.</p>	<p>Turn the AT-1082/PRC until maximum signal is indicated on the AN/URM-85.</p>	<p>Minimum acceptable sensitivity is 900 microvolts.</p>

CHAPTER 6

DEPOT OVERHAUL STANDARDS

6-1. Scope

The depot overhaul standards for Antenna, Loop AT-784/PRC, are designed to measure the performance capability of repaired equipment. Equipment that meets the minimum standards stated in the tests will furnish satisfactory operation, equivalent to that of new equipment.

6-2. Depot Overhaul Standards

To perform the tests for the depot overhaul

standards of Antenna, Loop AT-784/PRC, use the procedures for the general support testing procedures given in paragraphs 5-3 through 5-8. The tools and test equipment required for the procedures are given in paragraph 5-4. If the FINE TUNE control is consistently beyond position 2 during the frequency range tests (para 5-7), adjust coil L1 and capacitor C3 using the procedures in paragraph 5-2. After the adjustment, repeat the frequency range tests (para 5-7).

CHAPTER 7

SHIPMENT AND LIMITED STORAGE AND DEMOLITION TO
PREVENT ENEMY USE

Section I. SHIPMENT AND LIMITED STORAGE

7-1. Disassembly

If Antenna AT-1082/PRC is connected to a radio set, disconnect and remove its cable, retract the sense whip antenna, and turn down the loop.

7-2. Repacking for Shipment or Limited Storage

To repack for quick shipment or limited storage, place the AT-1082/PRC and its connecting cables into Bag, Cotton Duck CW-445/PRC.

Section II. DEMOLITION OF MATERIEL TO PREVENT ENEMY USE

7-3. Authority for Demolition

Demolition of the equipment will be accomplished only upon the order of the commander. The destruction procedures outlined in paragraph 7-4 will be used to prevent further use of the equipment.

7-4. Methods of Destruction

Use any of the following methods to destroy the equipment.

a. Smash. Smash the antenna (loop and sense whip), switches, and case; use sledges, axes, hand-axes, hammers, or crowbars.

b. Cut. Cut the output cables; use axes, hand-axes, knives, or machetes.

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

c. Burn. Burn cords, cables, and technical manuals; use gasoline, kerosene, oil, flame throwers, or incendiary grenades.

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

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

APPENDIX A REFERENCES

DA Pam 310-4	Index of Technical Manuals, Technical Bulletins, Supply Manuals (Types 7, 8, and 9), Supply Bulletins and Lubrication Orders.
DA Pam 310-7	US Army Index of Modification Work Orders.
TB 43-0118	Field Instructions for Painting and Preserving Electronic Command Equipment Including Camouflage Pattern Painting of Electrical Equipment Shelters.
TM 11-5095	Frequency Meter AN/URM-80.
TM 11-5820-398-12	Operator and Organizational Maintenance Manual Including Repair Parts and Special Tool Lists: Radio Set AN/PRC-25 (Including Receiver-Transmitter, Radio RT-505/PRC-25).
TM 11-5985-284-24P	Organizational, Direct Support, and General Support Maintenance Repair Parts and Special Tools Lists (Including Depot Maintenance Repair Parts and Special Tools): Antenna, Loop AT-784/PRC.
TM 11-6625-200-15	Operator's, Organizational, DS, GS, and Depot Maintenance Manual: Multimeters ME-26A/U, ME-26B/U, ME-26C/U, and ME-26D/U.
TM 11-6625-351-12	Operator and Organizational Maintenance Manual: Radio Interference Measuring Set AN/URM-85.
TM 11-6625-366-15	Operator's, Organizational, DS, GS, and Depot Maintenance Manual: Multimeter TS-352B/U.
TM 11-6625-508-10	Operator's Manual: Signal Generators AN/USM44 and AN/USM44A.
TM 38-750	The Army Maintenance Management Systems (TAMMS).
TM 750-244-2	Procedures for Destruction of Electronics Materiel to Prevent Enemy Use (Electronics Command).

APPENDIX B

BASIC ISSUE ITEMS LIST

Section I. INTRODUCTION

B-1. Scope

This appendix lists only basic issue items required by the crew/operator for installation, operation, and maintenance of Antenna, Loop AT-784/PRC.

B-2. General

The basic issue items list (Section II is a list, in alphabetical sequence, of items which are furnished with, and which must be turned in with the end item.

B-3. Explanation of Columns

The following provides an explanation of columns found in the tabular listings:

a. *Illustration*. This column is divided as follows:

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

(2) *Item Number*. Not applicable.

b. *Federal Stock Number*. Indicates the Federal stock number assigned to the item and will be used for requisitioning purposes.

c. *Part Number*. Indicates the primary number used by the manufacturer (indi-

vidual, company, firm, corporation, or Government activity), which controls the design and characteristics of the item by means of its engineering drawings, specifications standards, and inspection requirements, to identify an item or range of items.

d. *Federal Supply Code for Manufacturer (FSCM)*. The FSCM is a 5-digit numeric code used to identify the manufacturer, distributor, or Government agency, etc., and is identified in SB 708-42.

e. *Description*. Indicates the Federal item name and a minimum description required to identify the item.

f. *Unit of Measure (U/M)*. Indicates the standard of basic quantity of the listed item as used in performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation, (e.g., ea, in., pr, etc.). When the unit of measure differs from the unit of issue, the lowest unit of issue that will satisfy the required units of measure will be requisitioned.

g. *Quantity Furnished with Equipment (Basic Issue Items Only)*. Indicates the quantity of the basic issue item furnished with the equipment.

Section II. BASIC ISSUE ITEMS LIST

(1) Illustration		(2) Federal Stock Number	(3) Part Number	(4) FSCM	(5) Description Usable on Code	(6) Unit of Mess	(7) QTY FURN WITH EQUIP
(A) FIG. NO.	(B) ITEM NO.						
1-1		5985-973-0773	SC-DL-508819	80063	BAG, CANVAS CW-445/PRC	E A	1

APPENDIX C MAINTENANCE ALLOCATION

Section I. INTRODUCTION

C-1. General

This appendix provides a summary of the maintenance operations for AT-784/PRC. It authorizes categories of maintenance for specific maintenance functions on repairable items and components and the tools and equipment required to perform each function. This appendix may be used as an aid in planning maintenance operations.

C-2. Maintenance Function

Maintenance functions will be limited to and defined as follows:

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

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

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

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

e. Align. To adjust specified 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 equipment 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 discrep-

ancy 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 un-serviceable counterpart.

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

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

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

C-3. Column Entries

a. Column 1, Group Number. Column 1 lists

group numbers, the purpose of which is to identify components, assemblies, subassemblies, and modules with the next higher assembly.

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

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

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

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

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

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

C-4. Tool and Test Equipment Requirements (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.

C-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.

(Next printed page is C-3)

SECTION II MAINTENANCE ALLOCATION CHART
FOR
ANTENNA, LOOP AT-784/PRC

(1) GROUP NUMBER	(2) COMPONENT ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY					(5) TOOLS AND EQPT.	(6) REMARKS
			C	O	F	H	D		
00	ANTENNA , LOOP AT-784 /PRC	Inspect Service Install Replace Test Replace Repair Overhaul	0.1 0.1	0.1 0.1	0.5			1, 2 6 2 1 thru 5	A
01	ANTENNA AT-1082/PRC	Test Test Replace Repair Repair Align			0.5	1.0		1 1, 3, 5 thru 7	B
				0.1	0.5	0.5 1.0		2 2 1,3,5,6	C D
02	CABLE ASSEMBLIES CG-3244/PRC AND CG-2840/U	Inspect Test Repair		0.1	0.1 0.5			1 2	

SECTION III. TOOL AND TEST EQUIPMENT REQUIREMENTS
FOR

ANTENNA, LOOP AT-784/USC

TOOL OR TEST EQUIPMENT REF CODE	MAINTENANCE CATEGORY	NOMENCLATURE	NATIONAL NATO STOCK NUMBER	TOOL NUMBER
2	F, H, D	MULTIMETER AN/USM-223	6625-00-999-7465	
3	F, H, D	TOOL KIT, ELECTRONIC EQUIPMENT TK-105/G	180-00-610-8177	
	H, D	SIGNAL GENERATOR AN/USM-43	625-00-669-4031	
	H, D	FREQUENCY METER AN/GEM-80	625-00-649-4286	
	H, D	MULTIMETER MX-26B/U	625-00-646-9409	
	H	TOOL KIT, ELECTRONIC EQUIPMENT TK-101/G	180-00-064-5178	
	E, D	RADIO INTERFERENCE MEASURING SET AN/USM-85	625-00-776-0595	

SECTION IV. REMARKS

REFERENCE CODE	REMARKS
A	BY REPLACEMENT OF KNOBS, CABLES, WHIP ANTENNA, COVER, COVER GASKET.
B	CONTINUITY AND RESISTANCE TESTS.
C	REPLACEMENT OF COMPONENTS ON BANDSWITCH A2 AND ATTENUATOR SWITCH A3 ASSEMBLIES.
D	FREQUENCY RANGE ALIGNMENT.

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The Adjutant General.

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CofSptS (1)	USAARMS (30)	1-59 6-417
USAARENBD (2)	USAIS (30)	1-76 6-419
USAAESWBD (5)	USAES (2)	1-100 6-425
USAAVNTBD (5)	MFSS (5)	1-101 6-426
USACDCEA (1)	USAMPS (5)	1-107 6-429
USACDCEC (10)	USATSCH (5)	1-207 6-435
USACDCCBRA (1)	USATC Armor (2)	1-257 6-436
USACDCCEA (1)	USAECFB (2)	1-258 6-445
USAODCCEA (Ft Huachuca) (1)	USATC Inf (2)	1-307 6-449
USACDCOA (1)	USASTC (2)	5-7 6-455
USACDCQMA (1)	USATC FA (5)	5-25 6-456
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NG: State AG (3).

USAR: None.

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

