

CHAPTER 1

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Section I. GENERAL INFORMATION

1-1. Scope.

a. <u>Type of Manual</u>. This manual covers operator and organizational maintenance and includes Repair Parts and Special Tools List in appendix F.

b. <u>Purpose of Equipment</u>. Antenna AS-3577/GRC is a portable, omnidirectional, broadband antenna assembly that provides for transmission or reception of rf energy in the frequency range of 2 to 30 megaHertz (MHz).

1-2. Consolidated Index of Army Publications and Blank Forms. Refer to the latest issue of DA Pam 310-1 to determine whether there are new editions, changes, additional publications, or Modification Work Orders (MWOs) pertaining to the equipment.

1-3. Maintenance Forms, Records and Reports.

a. <u>Reports of Maintenance and Unsatisfactory Equipment</u>. Department of the Army forms and procedures used for equipment maintenance will be those prescribed by DA Pam 738-750 as contained in Maintenance Management Update.

b. <u>Report of Packaging and Handling Deficiencies</u>. Fill out and forward SF 364 (Report of Discrepancy (ROD)) as prescribed in AR 735-11-2/DLAR 4140.55/NAVMATINST 4355.73B/AFR 400.54/MCO 4430.3H.

c. <u>Discrepancy in Shipment Report (DISREP) (SF 361)</u>. Fill out and forward Discrepancy in Shipment Report (DISREP) (SF 361) as prescribed in AR 55-38/ NAVSUPINST 4610. 33C/AFR 75-18/MC0 P4610. 19D/DLAR 4500. 15.

1-4. Hand Receipt (-HR) Manuals. This manual has a companion document with a TM number followed by "-HR" (which stands for Hand Receipt). TM 11-5985-371-10-HR consists of preprinted hand receipts (DA Form 2062) that list end item related equipment (i.e., BII and AAL) you must account for. As an aid to property accountability, additional -HR manuals may be requisitioned from the Commander, Baltimore AG Publications Center, 2800 Eastern Blvd., Baltimore, MD 21220 in accordance with the procedures in chapter 3, AR 310-2, and DA Pam 310-10.

1-5. Reporting Equipment Improvement Recommendations (ELR). If your AS-3577/GRC needs improvement, let us know. Send us an ELR. You, the user, are the only one who can tell us what *you* don't like about your design. Put it on an SF368 (Quality Deficiency Report). Mail it to Commander, US Army Communications-Electronics Command and Fort Monmouth, ATTN: AMSEL-PA-MA-D, Fort Monmouth, New Jersey 07703-5000. We'll send you a reply.

1-6. Administrative Storage. Administrative storage of equipment issued to and used by Army activities will have preventive maintenance performed in accordance with the PMCS charts before storing. When removing the equipment from administrative storage, the PMCS should be performed to assure operational readiness. Disassembly and repacking of equipment for shipment or limited storage are covered in section VII of chapter 4.

1-7. Destruction of Army Electronics Materiel. Destruction of Army electronics materiel to prevent enemy use shall be in accordance with TM 750-244-2.

1-8. Nomenclature Cross-Reference List. Following is an alphabetical listing of the common names used in lieu of nomenclature in this manual. The nomenclature for which each common name is used is identified in the Nomenclature column.

COMMON NAME

NOMENCLATURE

Antenna AS-3577/GRC

Antenna Blue guy Cable adapter Carrying frame Guy plate Guy stake Halyard Insulator Mast assembly Mast base Mast section Multimeter Red guy Rf cable

Guy MX-382A/GRA-4 Adapter, Straight, Jack-to-Jack UG-29B Frame MX-1116/GRA-4 Guy Plate MX-378/U Guy Stake GP-111/G Halyard MX-516/GRA-4 Insulator MX-384/GRA-4 Antenna Mast Assembly AB-86/GRA-4 Mast Base AB-154/U Mast Section AB-85/GRA-4 Multimeter, Digital AN/PSM-45 Guy MX-383A/GRA-4 Rf Cable Assembly CG-1889B/U (100 feet) (30.5 meters) Guy MX-381A/GRA-4 Section II. EQUIPMENT DESCRIPTION AND DATA

1-9. Equipment Characteristics, Capabilities, and Features.

a. <u>General</u>. Antenna AS-3577/GRC is a portable, omnidirectional, broad band antenna.

b. <u>Purpose</u>. The antenna provides for transmission and/or reception of rf energy in the 2-30-MHz frequency range.

c. <u>Used With.</u> It is suitable for use with any high frequency (hf) single side band (SSB) radio on a normal path length of 0-380 miles (0-611 km).

d. <u>Mobility.</u> Components are packed in one carrying case weighing 260 1bs (108 kg). Four persons are required to lift or carry the carrying case. The antenna assembly can be unpacked and erected by two persons in 2 hours and disassembled and packed for movement in 2 1/2 hours.

e. <u>Site Requirements</u>. The antenna requires a minimum siting area of 120 feet by 70 feet (36.6 by 21.4 meters).



Table 2-1. Operator Daily Preventive Maintenance Checks and Services



(2) <u>Personnel</u>. At least two people must be available to install the antenna assembly.

(3) Tools. All of the tools needed to install the antenna assembly are provialed with the assembly. A hammer, 100-foot tape measure, and 1/4 inch slotted screwdriver are required.

b. Unpacking Carrying Case. See section II in chapter 4.

c. Placement of Mast Base.

(1) Using the 100-foot tape measure, locate and mark the center of the 120-foot by 70-foot plot chosen for the antenna site.

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Wear protective goggles while driving the mast base into the ground.

(2) Place the square plate 2 on the ground at the center. Set the swivel 1
on the mast base such that its male connector 3 is at a right angle to its ground stake 4 held vertically. Place the ground stake 4 through the hole in the plate 2 and point the swivel toward the center of the short side of the antenna site (point A). Put on protective goggles. Hammer the ground stake 4 vertically into the ground at the center of the antenna site. Remove the protective goggles.



d. Placement of Guy Stakes.

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Wear protective goggles while driving the four guy stakes into the ground. If the soil is either sandy or soft, see paragraph 2-7.

(1) General . The letters A, B, C, and D assigned to the guy stakes in the illustration (2) below are for purposes of illustration only. The assigned letters are not markings on the equipment. Use the 100-foot tape measure to make the measurements cited below. After-locating each guy stake as" described below, put on the protective goggles, and use the hammer to drive each guy stake into the ground at an approximate angle of 30° from vertical and away from the mast base ground stake. Drive each guy stake into the ground until only the guy connector is above ground.

(2) Locating Guy Stakes Locate guy stake A 25 feet (8.75 meters) from the mast base in the direction of the male connector **2** on the mast base swivel **1** as shown below. Drive guy stake A into the ground. Locate guy stakes B, C, and D approximately 90° apart as ill ustrated below and drive each guy stake into the ground.





f. Assembly of Mast. With the female end of the insulator and each mast section facing the mast base, place the insulator and the 16 mast sections on the ground, in a line from the mast base to guy stake A. Insert the female end of the insulator over the male end of the mast base. Insert the female end of the mast section nearest the insulator over the male end of the insulator. Add the next four mast sections (mast sections 2 through 5) allowing the mast sections to rest on the ground. Place a guy plate on the male end of mast section 5. Add mast sections 6 through 10 and place a guy plate on the male end of mast section 10. Add mast sections 11 through 16 and place a guy plate on the male end of mast section 16.

g. Attaching Terminating Resistor Stop to Mast. Using the terminating resistor stop clamp 1 and four wingnuts 2, mount the terminating resistor stop 3 2 foot 8 1/2 inches(0.52 meter) from the top of the mast 4.





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Before connecting the halyard to the mast, inspect the rope for worn spots, frays, rotted portions and any other faults. Replace a defective rope before connecting the halyard.

h. <u>Attaching Halyard to Mast.</u> Connect the pulley snaphook 1 to a hole in the top guy plate?. Rotate the top guy plate so the hole connected to the halyard 3 is on the same side of the mast as the terminating resistor stop 4. Thread the eyelet 5 on the halyard through the hole in the terminating resistor stop 4. Thread the other end of the halyard through the pulley 6 and tie the two ends of the halyard together.



i. Attaching Guys to Mast and Guy Stakes.

WARNI NG

Before attaching the guys, inspect guy ropes for worn spots, frays, rotted portions and other faults. Replace defective rope/ropes before erecting the mast.

(1) General . The guys are color coded (or marked in feet) for identification.

Top guy - red - 50 feet (15.25 meters). Center guy - white - 40 feet (12.2 meters). Bottom guy - blue - 31 feet (9.46 meters).



ADJUSTING POSITION



(2) <u>Stake A Guys.</u> Attach the snaphook on a red guy to the guy hole nearest the ground in the top guy plate. Attach the snaphook on a white guy to the guy hole nearest the ground in the center guy plate. Attach the snaphook on a blue guy to the guy hole nearest the ground in the bottom guy plate. Being careful not to tangle the guys, carry the free end of each of the three guys to guy stake B and attach the three guys to guy stake B. Adjust Fastener FT-9 on each guy to tighten the guys. While adjusting Fasteners FT-9, be careful not to bend the mast. Disconnect the three guys from guy stake B, coil each guy, jay the coils on the ground next to guy stake A and attach the loose end on each guy to guy stake A.



(3) <u>Stake B Guys.</u> The snaphooks on the guys to be connected to guy stake B are connected to the guy holes in the guy plates counterclockwise from the guy holes occupied by the snaphooks of the stake A guys.



Attach the snaphook on a red guy **1** to the B guy hole in the top guy plate 2. Attach the snaphook on a white guy 3 to the B guy hole in the center guy plate **4** . Attach the snaphook on a blue guy 5 to the B guy hole in the bottom guy plate 6. Being careful not to tangle the guys, carry the free end of each of the three guys to guy stake B 7 and attach the three guys to guy stake B 7. Adjust Fastener FT-9 on each guy to tighten the guys. While adjusting Fasteners FT-9, be careful not to bend the mast.

(4) <u>Stake D Guys</u>. The snaphooks on the guys to be connected to guy stake D are connected to the guy holes in the guy plates clockwise from the guy holes occupied by the snaphooks on the stake A guys.

Attach the snaphook on a red quy **1** to the D quy hole in the top guy plate 2. Attach the snaphook on a white quy **3** to the D quy hole in the center guy plate Attach the snaphook on a guy 5 to the D guy hole in the bottom guy plate **6** . Being careful not to tangle the guys, carry the free end of each guy to guy stake D 7 and attach the three guys to guy stake D. Being careful not to bend the mast, adjust Fastener FT-9 on each guy to tighten the guy.



(5) <u>Stake C Guys.</u> The snaphooks on the guys to be connected to guy stake C are connected to the guy holes in the guy Plates opposite the guy holes occupied by the snaphooks on the stake A guys 2. Attach the snaphook on the remaining red guy 3 to the C guy hole in the top guy plate 4. Attach the snaphook on the remaining white guy 5 to the C guy hole in the center guy plate 6. Attach the remaining blue guy 7 to the C guy hole in the bottom guy plate 8. Stretch the guys along the mast toward guy stake C 1. The guys are not connected to guy stake C 1 until after the mast is raised (j below).



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- Do not try to raise the mast during an electrical storm or when a storm is imminent.
- Do not try to raise the mast without at least two people.
- When raising the mast, allow only the personnel involved in raising the mast in the area.
- If the antenna must be erected when the ground is wet, frozen or slippery or the wind is blowing at a rate greater than 15 miles per hour (13 knots), at least four people (two at each location) should be available.

CAUTI ON

Before raising the mast, make sure the mast base swivel is positioned so that it will hinge (bend) toward guy stake C.

j. Raising the Mast.

(1) Two people are required to raise the mast. One person stands near the mast base $\boxed{1}$ the second stands near the top of the mast $\boxed{2}$.

(2) Person 1 pulls on the free set of guys 3 (guys to be connected to guy stake C 4) being sure to keep more tension on the top (red) guy 5 so that the mast bows slightly. At the same time, Person 2 lifts the top of the mast 2 from the ground and raises it above his-head.

(3) Person 1 walks slowly backward toward guy stake C 4 while pulling on the guys 3. At the same time, person 2 walks slowly forward toward the mast base 1 raising the mast as he goes.



(4) When the mast is upright and the guys held by person 1 are taut, being careful not to tangle the guys, person 2 attaches the red guv2, then the white guy 3 and last the blue guy 4 to guy stake C 5.

(5) If further adjustment is necessary to bring the mast more nearly vertical, first slack off the guys that are too short, then tighten the guys that are too long, and finally tighten the guys that were slacked off.



k. Assembly of Double Delta Antenna.

(1) Mounting the Balun. Using the balun clamp assembly 1 and four wingnuts
 , mount the balun 3 to the mast 4 6 feet 6 inches (2 meters) above ground level the balun clamp on the same side of the mast 4 as the terminating resistor stop clamp (para g above).



(2) Preparing Antenna Wire and Connecting to Terminating Resistor Box.

(a) Cut two 220-foot (67.1 meter) pieces of antenna wire from the 500-foot (152.5 meter) roll.

(b) Thread one antenna wire at midpoint (110 feet from each end between two flat washers on antenna connector 1 on the terminating resistor box 2 and secure by tightening hex nut. (Antenna connector 1 will hold the antenna wire going to antenna stakes B and C). Place and tighten a conductor splice 3 at the midpoint.



(c) Measure 60 feet (18.3 meters) from the midpoint on each loose end of each antenna wire, make a loop and place a conductor splice at each point. These loops will connect to the antenna stake lanyards.



(d) Repeat the procedure ((b) and (c) above) for the antenna wire to be connected to terminating resistor box antenna connector (Antenna connector will hold the antenna wire going to antenna stakes A. and D).

(3) Raising Terminating Resistor Box. Until the two ends of the halyard 1. Attach the slide hook 2 on the terminating resistor box 3 to the eyelet 4 on the halyard 1. Pull the loose end 5 of the halyard to raise the terminating resistor box 3 Intil it reaches the terminating resistor stop 6. Make sure the antenna wires are located between the middle and to guys. The the loose end 5 of the halyard to the cleat 7 on the balun clamp 8.



(4) Connecting Antenna Wire to Lanyards. Tie one Lanyard to each antenna stake, Leaving O feet from the antenna stake to the snaphook. Connect one end Loop 1 on one antenna wire to the snaphook 2 of the Lanyard 3 connected to antenna stake B 4. Attach the other end Loop of the same antenna wire to the Lanyard connected to antenna stake C. Attach one end Loop on the other antenna wire to the snaphook on the Lanyard connected to antenna stake D. PLace warning strip 5 on the antenna.



(5) <u>Connecting Antenna Wire to Balun</u>. Connect the two loose ends 1 of the piece of antenna wire (going to antenna stakes B and C) to antenna connector A 2 on top of the balun 3. Connect the two loose ends 4 of the other piece of antenna wire (going to antenna stakes A and D) to antenna connector B 5.



WARNI NG

If the antenna is to be connected to a transmitter, make certain that the transmitter is not transmitting and will not be turned on prior to connecting the rf cable/cables between the antenna and the transmitter.

CAUTI ON

Route the rf cable from the antenna assembly to the receiver/transmitter so that it will not be damaged by vehicles.

1. <u>Connecting Rf Cables</u>. Remove the protector cap from the connector. 2 • on the bottom of the bal un 3. Tie one end of one of the 100-foot (30.5 meter) rf cables 4 to the mast base 5 leaving enough of the end of the cable 4 to connect the cable to the bal un. If the other end of the 100-foot rf cable does not reach the connector on the transmitter/receiver, use the cable adapter 6 to connect a second 100-foot rf cable.







c. Disassembly of Safety Area Boundary.

(1) Remove the eight caution plates and warning strips from the safety area rope.

(2) Remove the lanyards from the four corner safety area rope stakes.

(3) Remove the safety area rope from the safety area rope stakes and coil and bind the rope.

(4) Pull the six safety area rope stakes from the ground and disassemble them.



d. <u>Disassembly of Double Delta Antenna.</u>

(1) Remove the warning strips from the antenna wires and disconnect the antenna wires **1** connected to the antenna wire connectors **2** on the bal un**3**.



(2) Until the loose end 1 of the halyard from the cleat 2 on the balun clamp 3 and lower the terminating resistor box 4. Disengage the slide hook 5 on the terminating resistor box 4 from the eyelet 6 on the halyard.



(3) Unsnap the snaphooks 1 on the four lanyards 2 and disconnect the antenna wire loops 3 from the four lanyards. Remove the three conductor splices
(4) on each antenna wire 5, and pull the antenna wire through the terminating resistor box connector. Coil and bind the antenna wires. Until the four lanyards 2 from the four antenna stakes 6. Remove and coil the lanyards. Remove the four antenna stakes from the ground, and separate the ground rods.



e. <u>Removal of Balun from Mast</u>. Remove the four wingnuts **1** and separate the balu**2** and the balun clamp **3** from the mast **4** Replace the four wingnuts on the balun.

WARNI NG

Do not try to lower the mast without at least two persons. If the mast must be lowered when the ground is wet, frozen or slippery or the wind is blowing at a rate greater than 15 miles per hour (13 knots), at least four persons (two at each location) should be available. f. Lowering the Mast.

(1) Two people are required to lower the mast. Person 1 stands near guy stake C (guy stake away from which the mast base swivel will bend; see illustration on page 2-5). Person 2 stands near the mast base 2 on the side of the mast opposite person 1.



CAUTI ON

Before lowering the mast, make sure the mast base swivel is positioned so that it will hinge (bend) in the desired direction.

(2) Person 1 removes the three guys 1 from guy stake C 2 while person 2 supports the mast 3 from the opposite side. Person 1 holds all three guys 1 firmly and walks slowly toward the mas 5. At the same time, person 2 walks backward slowly away from the mast and supports the mast 5 as it lowers to the ground.



g. Removal of Guys, Guy Stakes, and Halyard.

(1) Disconnect the three guys from guy stake C to the top 5 center 6 and bottom 7 guy plates. Coil and bind the three guys 1. Disconnect, coil and bind each of the three guys from ground stakes 68, D 9, and A 4 to the top, center and bottom guy plates.

(2) Remove the four guy stakes from the ground.





h. <u>Removal of Terminating Resistor Stop.</u> Remove the four wingnuts <u>1</u> and separate the terminating resistor stop <u>2</u> and terminating resistor stop clamp <u>3</u> from the mast <u>4</u>. Replace the four wingnuts <u>1</u> (on the terminating resistor stop <u>2</u>.



- i. Disassembly of Mast.
 - (1) Remove the insulator from the mast base. (See illustration on page 2-8).
 - (2) Separate the 16 mast sections and the three guy plates.
 - (3) Pull the mast base from the ground. Remove the support plate.
- j. Packing Carrying Frame and Carrying Case. See section VI, chapter 4.

Section III. OPERATION UNDER UNUSUAL CONDITIONS

2-7. Sandy or Marshy Terrain. If the ground in which the mast base, guy stakes, and antenna rods are to be inserted is sandy or marshy, get specific instructions from your supervisor on how to reinforce the mast base and stakes. The guy stakes may be reinforced by driving the four guy stakes into the ground at least 2 inches below the surface and burying the three guys connected to each guy stake in the ground.



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- a. Disconnecting Ground Rod from Insulator.
 - (1) Disconnect the grounding cable **1** from the insulator connector **2**.
 - (2) Pull the ground rod **3** from the ground.



b. <u>Disconnecting RF Cable</u>. After making certain the radio operator has disconnected the antenna rf cable from the radio, disconnect the rf cable connector **1** from the balun **2** at the base of the antenna mast **3**. Coil and bind the one or two 100-foot rf cables used to connect the antenna to the radio. Replace the protector cap **4** on the connector **5** at the bottom of the balun.





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4-5. Unpacking Carrying Frame.

a. Unfasten the two straps that hold the three mast sections in the mast section rack on top of the carrying frame. Remove the three mast sections from the mast section rack. Remove all guys, stakes, and the two mast sections from the trough in the carrying frame.

NOTE

Components of the mast assembly, including the carrying frame, are listed in c, below.



b. Loosen the turnbuckle on the cable holding the two end plates together. Unhook the cable and separate the two end plates from the 11 mast sections remaining on the perimeter of the end plates.



Table 4-1. Organizational Preventive Maintenance Checks and Services

NOTE

Advise the radio operator prior to and after performing PMCS.

ltem No.	Interval D W M	Item to be Inspected Procedure	Equipment Not Ready/Available If:
		WARNING If the antenna is connected to a trans- mitter, make certain the transmitter is not transmitting and will not be "turned on" prior to entering the area bounded by the safety area rope.	
1		<u>Installation.</u> Check that the antenna is properly in- stalled (para 2-5).	
2		Ropes. Check the 12 guys 1 hal yard 2, safety area rope 3 and lanyards 4 for damage such as cuts, frays, and for strain. Observe their general appear- ance for serviceability. Replace unserviceable ropes.	Ropes frayed, cut, or sagging.

M - Monthly

Table 4-1. Organizational Preventive Maintenance Checks and Services - Continued

D - Daily W - Weekly M - Monthly Equipment Not Ready/Avai I abl e ltem Interval Item to be Inspected D W M Procedure lf: No. 3 . Bolts, wingnuts, Mounting hardware. Check the bolts, washers, wingnuts. or clamps loose and clamps **2** securing the balun **3** or dirty. to the mast **4** to assure they are clean, intact, and not loose fitting. tighten, or replace. . Connectors Loose Rf cable connector, balun, and antenna wire 4 or dirty. connectors. Insure that the rf cable **5** and antenna wire connections **6** at the balun are clean, intact, and not loose fitting. 2 Clean, tighten connectors. 6 3 7 80 O C 0 8 0 5 4 5 Terminating resistor box connectors and antenna wire. Untie the halyard **7** from the cleat **8** on the balun 3 and lower the terminating resistor box to the ground.

M - Monthly

Table 4-1. Organizational Preventive Maintenance Checks and Services - Continued

W - Weekly

D

Equipment Not Ready/Avai I abl e Item to be Inspected ltem Interval lf: Procedure D W М No. Ensure that the antenna wire Connections Loose 1 and conductor splices **2** t the terminating or dirty. resistor box 3 are clean, intact and not loose. Clean and tighten connector splices **2**. 3 2 D

> Check the two 220-foot lengths of antenna wire for damage such as cuts, frays and strain. Replace the antenna wire if it appears not to be serviceable (para 4-16). Check the tightness of the three conductor splices 2 on each of the two pieces of antenna wire. Tighten or replace.



Antenna wire has cuts, frays, and strain. Conductor splices are loose.



Table 4-1. Organizational Preventive Maintenance Checks and Services - Continued

D - Daily

W - Weekly

M - Monthly

ltem No.	l nterval DWM	ltem to be Inspected Procedure	Equipment Not Ready/Available If:
		Being careful not to tangle the antenna wires and the guys, use the halyard 1 to raise the terminating resistor box 2 to the stop 3 on the mast 4 and tie the halyard 1 to the cleat 5 on the balur 6	
6		Modifications. Check DA Pam 310-1 for the publication of new applicable MWOs. Urgent MWOs must be applied immediately, normal MWOs must be scheduled.	An urgent MWO not applied.
7		<u>Preservation.</u> Check all accessible metal surfaces for corrosion, rust and moisture. Remove corrosion, rust and moisture and spot paint bare spots (para 4-18).	
8		Publications. Check DA Pam 310-1 to see that all pub- lications are available, complete, serviceable and current.	

Section IV. PRINCIPLES OF OPERATION

4-9. General. The AS-3577/GRC permits transmission or reception of rf energy in the 2-30 MHz frequency range. It is an omnidirectional, broad band, double delta antenna that can receive or transmit rf signals over a distance up to 380 miles. When used for transmission, it can handle power up to a maximum of 1 kilowatt.

4-10. Circuit Description. Refer to the schematic diagram below. The letters A, B, C, and D are terminal designations assigned during installation (para 2-5). They are not equipment markings. During reception or transmission, rf energy is conducted to or from the receiver or the transmitter, respectively, through the coaxial rf cable(s). The rf cable(s) is connected to the balun. The balun transformer matches the 50-ohm impedance of the rf cable to the 600-ohm input impedance of the antenna. The antenna radiating and receiving device is formed by wires configured into two delta arrangements. As configured, one half of one continuous antenna wire, and one half of the other continuous antenna wire form one delta, and the remaining halves form the other delta. The peaks of the two deltas are connected to the 600-ohm terminating resistor box.



Section V. ORGANIZATIONAL TROUBLESHOOTING

4-11. General. Troubleshooting at the organizational category is limited to visual checks and the use of a multimeter to isolate faults to the terminating resistor box, the balun, antenna wire, and electrical cables.

4-12. Troubleshooting Table. The malfunctions listed in table 4-2 can show up during operation of the radio, during scheduled PMCS (tables 2-1 and 4-1), during assembly and preparation for use (para 2-5), during preparation for movement (para 2-6) or during corrective maintenance.

Mal functi on

Test or Inspection Corrective Action

WARNI NG

 $If \ the \ antenna \ is \ connected \ to \ a \ transmitter, \ make \ sure \ the \ transmitter \ is not \ transmitting \ and \ will \ not \ be \ turned \ on \ prior \ to \ di \ sconnecting \ or \ connecting \ the \ rf \ cable \ and/or \ entering \ the \ area \ bounded \ by \ the \ safety \ area \ rope.$

- 1. WEAK OR NO RECEPTION AT THE RECEIVER.
 - Step 1. Make sure the rf cable is neither disconnected nor broken.

Connect the rf cable. Replace the rf cable.

Step 2. Disconnect the rf cable 1 from the rf connector 2 on the balun 3. Use the multimeter to measure the resistance between the inner conductor of the rf connector 2 to the outer case (bare spot) of the balun 3. The reading should be less than one ohm.



If normal, go to step 3. If abnormal, replace the balun (para 4-15).

Table 4-2. Organizational Troubleshooting - Continued

Mal functi on						_			— .		
Test or	Inspection										
	Correc	ti ve	Action			_		_	_		
Step 3.	Di sconnect	the	antenna	wire	from	one	antenna	connec	tor 2	on	the
51CP 5.		the '				One	unternu	- CONNEC			

- balun 3. Use the multimeter to measure the resistance between the two antenna connectors 2. Reading should be less than 1 ohm.
 - lf normal, go to step 4.
 - If abnormal, replace the balun (para 4-15).



- Step 4. Use the multimeter to measure the resistance between either antenna connector 1 and the outer shell of the rf cable connector 2. Reading should be infinite (open circuit).
 - If normal, go to step 5. If abnormal, replace the balun (para 4-15).



Table 4-2. Organizational Troubleshooting - Continued

Mal functi on		
Test or	Inspection	
	Corrective	Action

- Step 5. Use the multimeter to measure the resistance between the two antenna wires 1 removed from one antenna connector 2 on the balun and the two antenna wires 3 not removed) from the other connector 4 of the balun. Normal reading is 600 ohms.
 - If normal, go to step 6. If abnormal, go to step 7.



- Step 5. Check for continuity of each of the two antenna wires 1. That is, use the multimeter to check for continuity (less than 1 ohm) between the two ends of the antenna wire removed from one antenna connector
 2. Repeat the measurement for the antenna wires connected to the other connector 3, after disconnecting the wires.
 - If normal, reconnect the rf cable and antenna wires. If abnormal, replace both antenna wires (para 4-16).



Table 4-2. Organizational Troubleshooting - Continued

Mal function		
Test or	Inspection	
	Correcti ve	Action

NOTE

Do not perform step 7 if the reading in step 5 was normal.

Step 7. Until the halyard from the cleat on the balun and lower the terminating resistor box to the base of the mast. (Make sure the antenna wire loose ends are disconnected from the connectors on top of the balun and the two separate antenna wires are not making contact.) Measure the resistance between the two antenna connectors on the terminating resistor box 5. Reading should be 600 ohms.

If normal, raise the terminating resistor box with the halyard , and tie the loose end of the halyard to the balun cleat . Reconnect the antenna wire loose ends to the balun. If abnormal, repair and replace the terminating resistor box (para 4-14).



2. FAULTY TRANSMISSION. Repeat steps 1 through 7 above.





c. Replacement.

(1) Wrap each antenna wire **1** at the midpoint around each terminating resistor box connector **2** on each side of the terminating resistor box **3**.

(2) Place and tighten a conductor splice on the antenna wires coming from each terminating resistor box connector.

(3) Replace the conductor splices forming the antenna loops that attach the antenna wire to the four antenna stake lanyards (para 4-16).

(4) Engage the slide hook **5** on top of the terminating resistor box to the eyelet on the halyard **6**.

(5) Using the halyard 6, raise the terminating resistor box 3 on the mast 7 until the terminating resistor box 3 reaches the terminating resistor box stop 8

(6) Tie the loose end of the halyard **6** to the cleat **9** on the balun clamp

(7) Connect the loose ends of the antenna wire to the balun (para 4-15b(2)).

(8) Connect the antenna wire end loops, formed with the conductor splices, to the antenna stake lanyards (para 4-16b(6)).

(9) Notify the radio operator to reconnect the antenna rf cable to the radio.



4-15. Removal and Replacement of Balun.

W<u>ARNIN</u>G

If the antenna is connected to a transmitter, make certain the radio operator has disconnected the antenna rf cable from the transmitter before entering the roped-off radiation hazardous area to replace the balun.

a. <u>Removal</u>.

(1) After making certain the radio operator has disconnected the antenna rf
cable from the radio, disconnect the rf cable connector
2 on the balun
3 at the base of the antenna mast

(2) Disconnect the antenna wires **5** connected to the antenna wire connectors **6** on top of the balun **3**.

(3) Remove and retain the four wingnuts **7** and separate the balun **3** and balun' clamp **8** from the mast **4**.



b. Replacement.

(1) Place the balun clamp **3** and balun **3** on the mast **4**; replace the four wingnuts **7** securing the balun to the mast **4** and balun clamp. Before tightening the wingnuts **7** slide the balun and balun clamp up or down the mast until the balun is 6.5 feet from ground level. Secure the four wingnuts **7**.

(2) Connect the antenna wires **5** to the antenna wire connectors **6** on top of the balun.

(3) Connect the cable connector **1** to the rf connector **2** on the balun.

(4) Notify the radio operator to reconnect the antenna rf cable to the radio.

4-16. Removal and Replacement of Antenna Wire. If one antenna wire is worn, frayed or broken, both should be replaced. The instructions in a and b below cover removal and replacement of both 220-foot pieces of antenna wire.

WARNI NG

If the antenna is connected to a radio, make certain the radio operator has disconnected the antenna rf cable from the radio before entering the roped-off rf radiation hazardous area to replace the antenna wire.

a. Removal.

(1) After making certain the radio operator has disconnected the antenna rf cable from the radio, disconnect the two antenna wires 1 connected to the antenna connector 2 on the balur 3.

(2) Until the halyard 4 from the cleat 5 on the balun and lower the terminating resistor box 6 to the base of the mast.



(3) Disconnect the antenna wire Loops from the snaphooks on the four lanyards connected to antenna stakes A, B, C and D (para b(6) below). Remove the four conductor splices at the lanyards.

(4) Remove the two conductor splices **Z** from the antenna wires connected to the terminating resistor box connectors **3**. Remove the antenna wires from the terminating resistor box **3**.

b. Replacement.

(1) Cut two 220-foot pieces of antenna wire from the 500-foot roll.

(2) Wrap one antenna wire at the midpoint (110 feet from each end) around antenna connector 1 on the terminating resistor box 2 (terminal A will hold the antenna wire going to antenna stakes B and C) (para 2-5e)). Place and tighten a conductor splice 3 at the midpoint.



(3) Measure 60 feet from the midpoint of each loose end of the antenna wire, make a loop, and place a conductor splice at each point. These loops will connect to the snap hooks on the lanyards attached to antenna stakes B and C ((6) below).

(4) Repeat the procedures ((2) and (3) above) for the antenna wire to be connected to terminating resistor box connector $\boxed{4}$ (terminal B will hold the antenna wire going to antenna stakes A and D (para 2-5e)).



WARNI NG

Do not try to raise the terminating resistor box to the top of the mast during an electrical storm.

(5) Attach the slide hook 1 on the terminating resistor box 2 to the eyelet 3 on the halyard 4. Pull the loose end of the halyard 4 to raise the terminating resistor box 2 until it reaches the terminating resistor stop 5. Make sure the antenna wires are located between the middle and top guys. Tie the loose end of the halyard 4 to the cleat 6 on the balun clamp 7 which mounts the balun 8 to the mast.



(6) Attach one of the end loops 1 on one antenna wire from the connector A on the terminating resistor box to the snap hook 2 on the lanyard 3 connected to the antenna stake B 4 (para 2-5e). Attach the other end loop on the same antenna wire to the snaphook on the lanyard connected to antenna stake C. Attach one of the end loops on the antenna wire from the connector B on the terminating resistor box to the snaphook on the lanyard connected to antenna stake A and the other end loop to the snaphook on the lanyard connected to antenna stake D.



(7) Connect the two loose ends 1 of the antenna wire (going to antenna stakes B and C) to antenna connector A 2 balun 3 connect the two loose ends 4 of the other antenna wire (going to antenna stakes A and D) to antenna connector B 5 on the balun 3.



(8) Notify the radio operator to connect the rf cable to the radio.

4-17. Cleaning.

WARNI NG

The fumes of trichlorotrifluoroethane are toxic. Refer to WARNING page in front of this manual for precautions to follow when using trichlorotrifluoroethane.

a. Use a dry, clean, lint-free cloth (item 2, appx E) or brush (item 1, appx E) to remove dust or dirt. If necessary, moisten the cloth or brush with trichloro-trifluoroethane (item 3, appx E). After cleaning, wipe dry with a clean cloth.

WARNI NG

Compressed air is dangerous and can cause bodily harm. Refer to WARNING page in front of this manual for precautions to follow when using compressed air.

b. Dry, compressed air, not to exceed 29 psi, may be used to remove dirt and dust from inaccessible places.

4-23. Packing Carrying Frame.

a. Insert 11 mast sections in the 11 receptacles in each of two end plates of the carrying frame. Hook the cable and turnbuckle that hold the end plates together and tighten the turnbuckle to secure the 11 mast sections to the end plates. The 11 mast sections and the two end plates form a trough in which the remaining components of the mast assembly are packed.



b. Using the guys and halyard to cushion the metal components, place the components listed below in the trough.

NOTE

Three mast sections will be left to be used as instructed in c below.

Quanti ty	ltem		
4 4 5 5 1 1 1 2 1 1	Guy MX-381A/GRA-4 Guy MX-382A/GRA-4 Guy MX-383A/GRA-4 Guy Plate MX-1470/U Guy Stake GP-111/G Halyard MX-516/GRA-4 Hammer Mast Base AB-154/U Mast Section AB-85/GRA-4 Insulator MX-384/GRA-4 Plate (6 inch square)		

c. Insert the remaining three mast sections in the mast section racks in the two end plates. Using the two straps attached to the mast section racks of the carrying frame, strap the three mast sections in place.



4-24. Packing Carrying Case. Pack the carrying frame (para 4-23) and all remaining components of the AS-3577/GRC into the carrying case.

a. Open the hinged cover of the carrying case.

b. Place the packaged carrying frame (para 4-23) to the right and back of the carrying case.

c. Place the terminating resistor box inside the terminating resistor box stop and place it at the left.

d. Place the 31 ground rods in the carrying case in front of the carrying frame.

e. Use the four lanyards as a cushion and place them over the ground rods.

f. Place the balun to the left, on top of the lanyards.

g. Place the following also on the lanyards:

- (1) Goggl es.
- (2) Bag containing 6 conductor splices and electrical tape.
- (3) Measuring tape, 100-foot.

(4) One roll of 2-inch warning strips, and 2 rolls of 3/4-inch warning strips.

(5) One roll of antenna wire and the cable adapter.



4-27







Figure F-1. Antenna AS-3577/GRC (Sheet 2 of 4)



Figure F-1. Antenna AS-3577/GRC (Sheet 3 of 4)



Figure F-1.Antenna AS-3577/GRC (Sheet 4 of 4)



Figure F-2. Terminating Resistor Box Assembly