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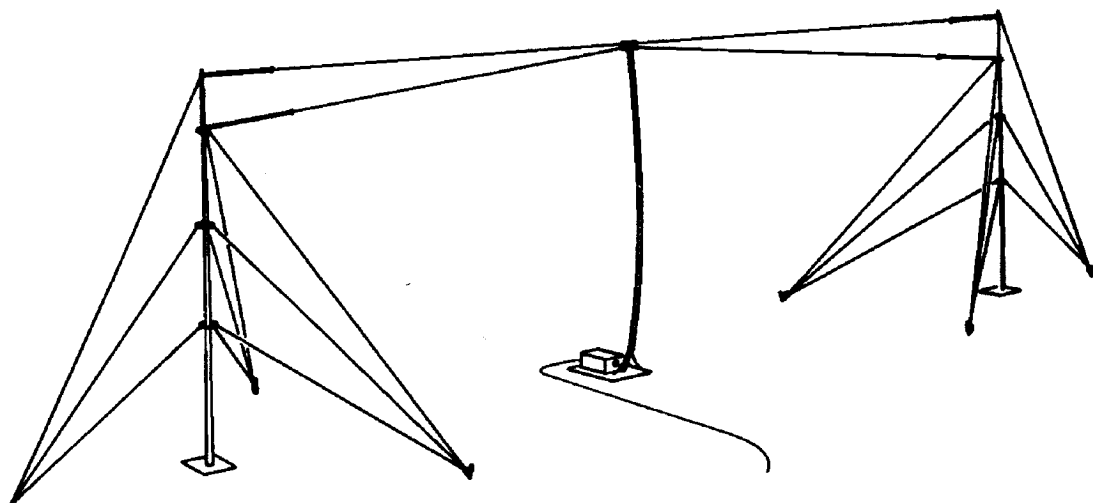
HARRIS

RF COMMUNICATIONS

ANTENNAS

RF-1912, RF-1912A

INSTALLATION INSTRUCTIONS



SECTION 1

GENERAL INFORMATION

1.1 INTRODUCTION

The RF-1912 and RF-1912A Antennas are electrically identical antennas that can be connected as high-angle dipoles for short-to-medium range skywave propagation, or as top-loaded verticals for short-range groundwave or long-range skywave propagation. The RF-1912 Antenna is intended for temporary installations on the ground, and is provided with stakes to anchor guy ropes and baseplates. The RF-1912A Antenna is provided with special hardware and guys for permanent rooftop or ground installations. Instructions are provided for installing the RF-1912A Antenna on solid masonry or wooden roofs, and on concrete pads for permanent ground installations. The RF-1912 and RF-1912A Antennas can be used with the RF-382, RF-2601, RF-3281, or RF-3282 Antenna Coupler. Figure 1-1 shows the RF-1912 and RF-1912A Antennas. Two people are required to install either antenna. In some circumstances, local laws may govern the installation of antennas. Zoning or building permits may be required.

WARNING

The installation of antennas and their associated support structures requires specialized skills. These installations should only be made by personnel experienced in these skills and only after they have thoroughly read and understood the supplied documentation. Failure to do so could result in serious damage to the equipment and injury to personnel both during and after installation. Upon request, Harris Corporation can supply training in the techniques required. Harris Corporation assumes no responsibility or liability for any damage or injury that may occur as the result of any installation.

1.2 SAFETY INFORMATION

Each year, hundreds of people are killed, mutilated, or receive severe permanent injuries when attempting to install or dismantle an antenna. In many of these cases, the victim was aware of the dangers of electrocution but did not take adequate steps to avoid the hazard.

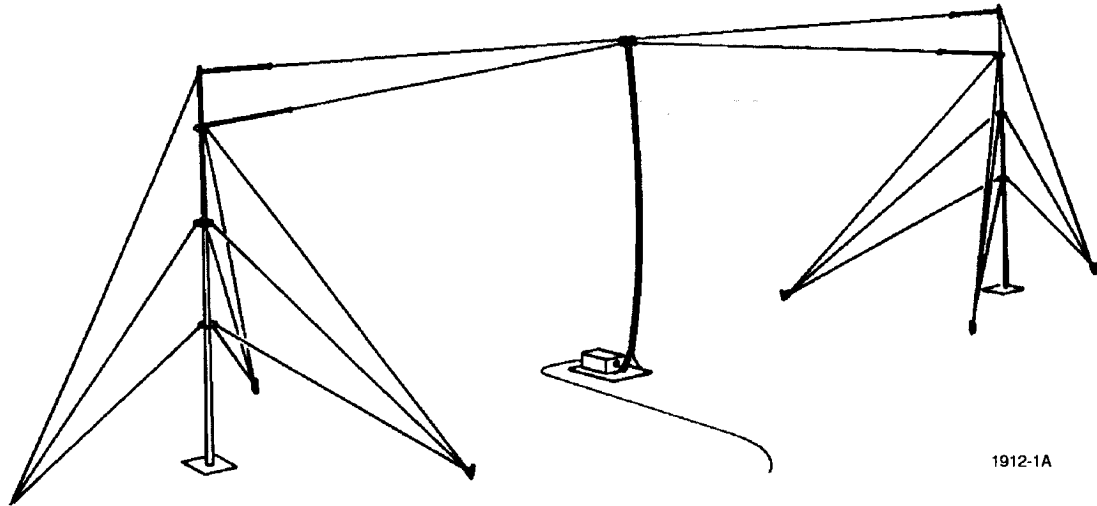
For your safety and to help achieve a safe installation, read and follow the safety precautions below. They may save your life.

1. If you are installing or dismantling an antenna for the first time, for your own safety as well as others, seek professional assistance. Consult your dealer. He can explain which mounting or dismantling method to use for the size and type antenna you are about to install or dismantle.
2. Select your installation site with safety, as well as performance, in mind. (Refer to the site selection information.) Remember: power lines and phone lines look alike. For your safety, assume that any overhead lines can kill you.
3. Call your power company. Tell them your plans and ask them to look at your site. This is little inconvenience considering your life is at stake.
4. Before you begin, plan your installation or dismantling procedure carefully. Successful installation or dismantling of a mast or tower is largely a matter of coordination. Each person should be assigned to a specific task and should know what to do and when to do it. One person should be designated as the "boss" to call out instructions and watch for signs of trouble.

5. When installing or dismantling your antenna, remember: do not use a metal ladder. Do not work on a wet or windy day or if a thunderstorm is approaching. Dress properly – shoes with rubber soles and heels, rubber gloves, long sleeve shirt or jacket, and a hardhat.
6. If the assembly starts to drop, get away from it and let it fall. Remember: the antenna, mast, cable, and metal guy wires are all excellent conductors of electrical current. Even the slightest touch of any of these parts to a power line completes an electrical path through the antenna and the installer – that's you!
7. If any part of the antenna system should contact a power line, do not touch it or try to remove it yourself. Call your local power company. They will remove it safely.
8. If an electrical accident should occur, do not grab hold of the person in contact with the power line or you too will be electrocuted. Use a dry board, stick, or rope to push or pull the victim away from the antenna. If the victim has stopped breathing, administer artificial respiration and stay with it. Have someone call for medical help.

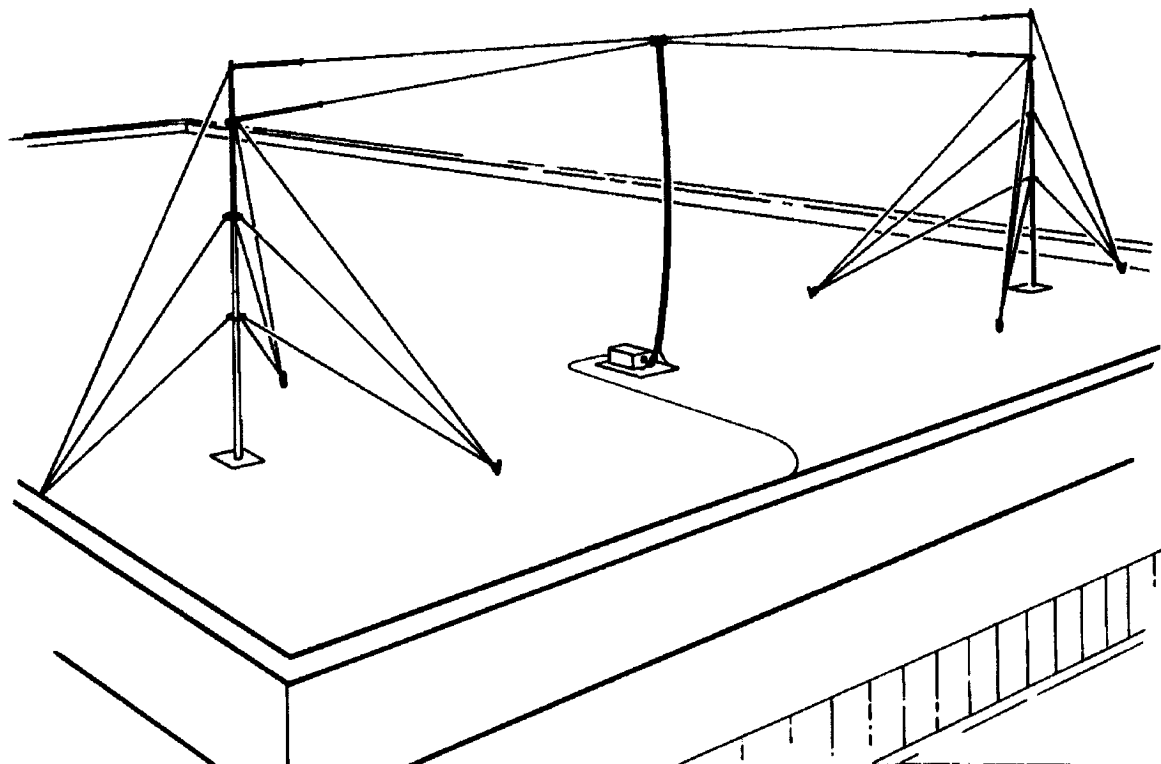
1.3 SITE SELECTION

Select a tower location sufficiently clear and out of falling distance of power lines since every electrical and telephone wire should be considered dangerous. The only safe distance from power lines is at least twice the height of the tower. Tower should be installed and dismantled by experienced and trained personnel. All antenna installations must be grounded per local or national codes.



1912-1A

A. RF-1912 ANTENNA – TEMPORARY GROUND INSTALLATIONS



B. RF-1912A ANTENNA – PERMANENT ROOF OR GROUND INSTALLATIONS ON MASONRY OR OTHER HARD SURFACES

1912-2A

Figure 1-1. RF-1912 and RF-1912A Antenna Installations

SECTION 2

RF-1912 INSTALLATION

2.1 UNPACKING AND INSPECTION

The antenna is shipped from the factory disassembled. Parts should be checked against the appropriate tables (tables 2-1 to 2-13) before installation begins. Any missing or damaged parts should be reported to the appropriate authority.

Table 2-1. RF-1912 Antenna Parts List (6906-2000-01 Rev. K) (See figure 1-1 A.)

Qty.	Part Number	Description
2	H96-0001-102	CPLG BRZ .50 DI
1	H96-0001-202	DRIVING STUD
2	H96-0001-503	GROUND CLAMP
2	H96-0002-101	PIPE CLAMP CAST
4	MS35335-62	LW SS EXT. #5/16
1	10075-0480	WIRE 200 FT COIL
2	6906-0100	MAST ASSY KIT (Refer to table 2-3.)
2	6906-0110	BASE ASSY (Refer to table 2-4.)
1	6906-0200	RF-1912 SPARES KIT (Refer to table 2-2.)
4	6906-0249	BASEPLATE STAKE ASSY (Refer to table 2-5.)
1	6906-0300	CANVAS BAG SET (Refer to table 2-7.)
1	6906-2052	RF-1912MRF-1912A
1	6906-2100-01	DIPOLE RADIATOR ASSY (Refer to table 2-10.)
2	H96-0001-003	SECT. GROUND ROD
2	6906-0104	TOWER ASSY MODIFIED
6	6906-0250	GUY STAKE ASSY (Refer to table 2-6.)
1	6906-2300	BASEPLATE (Refer to table 2-9.)
2	10213-1710-01	ASSY, PRIMARY GUY (Refer to table 2-11.)
4	10213-1710-02	ASSY, SECONDARY GUY (Refer to table 2-12.)
1	6906-2400	RF-1912 SITE TEMPLATE ASSY (Refer to table 2-13.)

Table 2-2. RF-1912 Spares Kit (6906-0200 Rev. M)

Qty.	Part Number	Description
1	6906-0215	JUMPER WIRE
7	MS15795-813	FW SS .375X.875X.083
1	MS35307-358	BOLT HEX HD 3/8-16X3/4
6	MS35307-364	BOLT HEX HD 3/8-16 X 1-1/2
7	MS35338-141	LW SPLT SS 3/8
3	W52-0002-001	WIRE SIL BRNZ ANT 32AWG
3	Z32-0002-001	KEVLAR ROPE
2	10075-0465	INSULATOR, ANTENNA

Table 2-2. RF-1912 Spares Kit (6906-0200 Rev. M) (Cont.)

Qty.	Part Number	Description
1	10075-0466	INSULATOR, CENTER
10	10075-1056	CABLE TIE
2	10075-1058	CONN SPLIT BOLT #16-10AWG
1	10213-1705	GUY ASSY, TOP
1	6906-0206	APPLICATION INSTRUCTIONS
1	6906-0211	GROUND STRAP
1	6906-0254	COTTER, HAIRPIN
25 FT.	6906-2109	TWIN LEAD
1	10075-1036	CARABINER OVAL NON-LCKING
6	MS51971-3	NUT 9/16HEX 3/8-16

Table 2-3. Mast Assembly Kit Parts List (6906-0100 Rev. K) (See figure 2-4.)

Qty.	Part Number	Description
9	H78-0003-001	S-HOOK, S.S.
4	H78-0003-003	S-HOOK, 1 1/2 S.S.
1	10075-1330	1/4 X 3 EYEBOLT, S.S.
2	10075-0493	CHAIN, #10
2	MS15795-810	FW SS .281X.625X.065
2	6906-0254	COTTER, HAIRPIN
1	MS35338-139	LW SPLT SS 1/4
1	H34-0008-001	NUT EYE 1/4-20
1	10075-0614	GUY RING, SMALL 1-1/4ID
2	10075-0615	GUY RING, LARGE 1-3/4ID
1	10075-0616	CLAMP, SMALL 1-1/4ID
1	10075-0617	CLAMP, MED. 1-1/2ID
1	10075-0618	CLAMP, LARGE 1-3/4ID
.042 FT.	E50-0002-007	SHRINK SLEEVING, 3/8" BLACK
.042 FT.	E50-0002-208	SHRINK SLEEVING, 1/2" RED
.042 FT.	E50-0002-609	SHRINK SLEEVING, 3/4" BLUE
.042 FT.	E50-0002-409	SHRINK SLEEVING, 3/4" YELLOW

Table 2-4. Base Assembly Parts List (6906-0110 Rev. B) (See figure 2-2.)

Qty.	Part Number	Description
1	6906-0111	BASE PLATE
1	10075-0494	SWIVEL FLANGE
2	MS35307-333	BOLT HEX HD 5/16-18X7/8
2	MS35338-140	LW SPLT SS 5/16

Table 2-4. Base Assembly Parts List (6906-0110 Rev. B) (See figure 2-2.) (Cont.)

Qty.	Part Number	Description
2	MS35649-2314	NUT SS 5/16-18
1	6906-0112	HEX WRENCH
1 FT. 3 IN	Z08-0005-000	CHAIN, SIZE 14
2	MS15795-812	FW SS .344X.688X.065
1	MS51957-81	PHS SS 1/4-20X3/4
2	MS15795-810	FW SS .281X.625X.065
1	MS35338-139	LW SPLT SS 1/4
1	MS35649-2254	NUT SS 1/4-20
1	10075-0477	LUG 1/4"-14-2 CABLE
2	H78-0003-003	S-HOOK, 1 1/2 S.S.

Table 2-5. Base Plate Stake Assembly Parts List (6906-0249 Rev. C)

Qty.	Part Number	Description
1	6906-0251	GUY STAKE, 17.5"
1	10075-1321	EYE BOLT, S.S. 1/4-20
1	MS15795-810	FW SS .281X.625X.065
1	H-4183	NUT STOP CRS/CAD 1/4-20

Table 2-6. Guy Stake Assembly Parts List (6906-0250 Rev. F)

Qty.	Part Number	Description
1	6906-0252	GUY STAKE
2	MS35691-3	NUT, JAM 1/4-20
1	10075-1321	EYE BOLT, S.S. 1/4-20
1	MS15795-810	FW SS .281X.625X.065

Table 2-7. Canvas Bag Set Parts List (6906-0300 Rev. B)

Qty.	Part Number	Description
1	6906-0301	BAG, MAST
1	6906-0302	BAG, STAKES
1	6906-0303	BAG, ACCESSORIES

Table 2-8. Dipole Assembly Parts List (6906-2100 Rev. S) (See figure 2-8.)

Qty.	Part Number	Description
4	MS25036-149	LUG RNG CR #8 22-18RED
118 FT. 3 IN	W52-0002-001	WIRE SIL BRNZ ANT 32AWG
23 FT.	6906-2109	TWIN LEAD
27 FT. 10 IN	Z32-0002-001	KEVLAR ROPE
4	Z20-0004-109	SPRING, TENSION S.S.5X.75
1	10075-0466	INSULATOR, CENTER
24	H96-0005-006	FERRULE, AL CABLE 1/8 D.
8	H96-0004-004	FERRULE COPPER SWGE .062
1	MS51958-69	PHS SS 10-32X1-1/2
1	MS35650-304	NUT SS 10-32
2	MS15795-808	FW SS .219X.438X.049
1	MS35338-138	LW SPLT SS #10
8	H-4162	SCREW, RND HEAD, BLK NYLON
16	H-4179	NUT NYLON BLACK 10-32
4	H12-0003-205	SCREW, PH, 6-32X.38
4	H40-0001-003	FW BRS/NCKL .147X.31X.028
4	H41-0001-003	LW BVGZ/NCKL SPLT #6X.031
2	P545-M01-F07-63	P545-M01-F07-632 STANDOFF
1	6906-2105	INSULATOR PROTECTOR
2	6906-2106	LINE SUPPORT PLATE
2	6906-2107	LINE CLAMP
4	H12-0003-309	SCREW, PH, 8-32X.75
16	H40-0001-004	FW BRS/NCKL .172X.38X.032
8	H41-0001-004	LW BVGZ/NCKL SPLT# 8X.040
8	H30-0001-004	NUT HEX BRSS NCKL 8-32
4	E59-0003-011	LUG RNG #8 16-14GA PLAIN
2	10075-0471	FAST EYE SNAP
2	E-0119	TRM RNG #1/4 16-14AWG PLN
6	H78-0003-004	S-HOOK, S.S.
2	MS25036-153	LUG RNG CR #8 16-14BLU
4.5 FT.	E50-0003-013	SLVG TFL .106 ID
12	AN100-C4	ROPE THIMBLE SS
5	10075-1056	CABLE TIE
.083 FT.	E50-0002-008	SHRINK SLEEVING, 1/2" BLACK
.083 FT.	E50-0002-208	SHRINK SLEEVING, 1/2" RED

Table 2-9. Baseplate Assembly Parts List (6906-2300 Rev. C)

Qty.	Part Number	Description
1	2066-0001	ANTENNA BASE PLATE
2	10075-1321	EYE BOLT, S.S. 1/4-20
5	MS15795-810	FW SS .281X.625X.065
4	MS35690-410	NUT, HEX 1/4-20
1	10075-0462	LUG
1	MS51957-81	PHS SS 1/4-20X3/4
1	MS35338-139	LW SPLT SS 1/4
1	MS35649-2254	NUT SS 1/4-20
5	H12-0003-410	SCREW, PH, 10-32X.88
20	H40-0001-005	FW BRS/NCKL .200X.44X.036
10	H30-0001-005	NUT HEX BRSS NCKL 10-32
10	H41-0001-005	LW BVGZ/NCKL SPLT#10X.047

Table 2-10. Dipole Radiator Assembly Parts List (6906-2100-01 Rev. -)

Qty.	Part Number	Description
1	6906-2100	DIPOLE ASSY
2	Z87-0002-001	CORD WRAP, ORANGE
1	10467-7237-01	CANVAS BAG, GREEN

Table 2-11. Primary Guy Assembly Parts List (10213-1710-01 Rev. -) (See figure 2-6.)

Qty.	Part Number	Description
1	10213-1705	GUY ASSEMBLY, TOP
1	10213-1704	GUY ASSEMBLY, MIDDLE
1	10213-1703	GUY ASSEMBLY, LOWER
1	10075-1036	CARABINER OVAL NON-LCKING
1	10467-7237-04	CANVAS BAG, YELLOW
1	Z87-0001-001	CABLE WRAP, BLACK

Table 2-12. Secondary Guy Assembly Parts List (10213-1710-02 Rev. -) (See figure 2-6.)

Qty.	Part Number	Description
1	10213-1706	GUY ASSEMBLY, UPPER
1	10213-1704	GUY ASSEMBLY, MIDDLE
1	10213-1703	GUY ASSEMBLY, LOWER
1	10075-1036	CARABINER OVAL NON-LCKING
1	10467-7237-02	CANVAS BAG, BLUE
1	Z87-0002-001	CORD WRAP, ORANGE

Table 2-13. RF-1912 Site Template Assembly (6906-2400 Rev. -)

Qty.	Part Number	Description
230 FT.	Z32-0002-001	KEVLAR ROPE
27	H96-0005-006	FERRULE AL CABLE 1/8" DIA
26	AN100-C4	ROPE THIMBLE SS
2	10075-0471	FAST EYE SNAP
4	H78-0004-125	QUICK LINK 1/8" DIA
4	6906-0107	STEEL RING
1	Z87-0001-001	CABLE WRAP, BLACK
1	10467-7237-03	CANVAS BAG, BLACK

2.2 ANTENNA SITE AND ANTENNA ORIENTATION

For maximum performance and safety, careful consideration should be given to selecting an installation site. The installation site should be flat, free of overhead obstacles, and free from possible flooding. Close proximity to metallic structures such as electrical wires, fences, buildings, etc. should be avoided. Such structures should never come in contact with the antenna.

Ensure that bordering vegetation or structures cannot fall on the antenna system. Likewise, the antenna system could fall on surrounding structures if improperly installed or if its support structures are damaged by severe weather conditions. Carefully plan during site selection to minimize these hazards.

Generally, the higher the antenna with respect to the surrounding countryside, the better its performance will be. If possible, the broadside of your antenna should face the station(s) with which you will be communicating. The RF-1912 is provided with rope guys and metal stakes for temporary ground installations. Plan installation using dimensions, baseplate, stake locations, and Site Template Assembly shown in figure 2-1.

NOTE

For rolling or uneven terrain, the dimensions in figure 2-1 may need to be adjusted for proper installation.

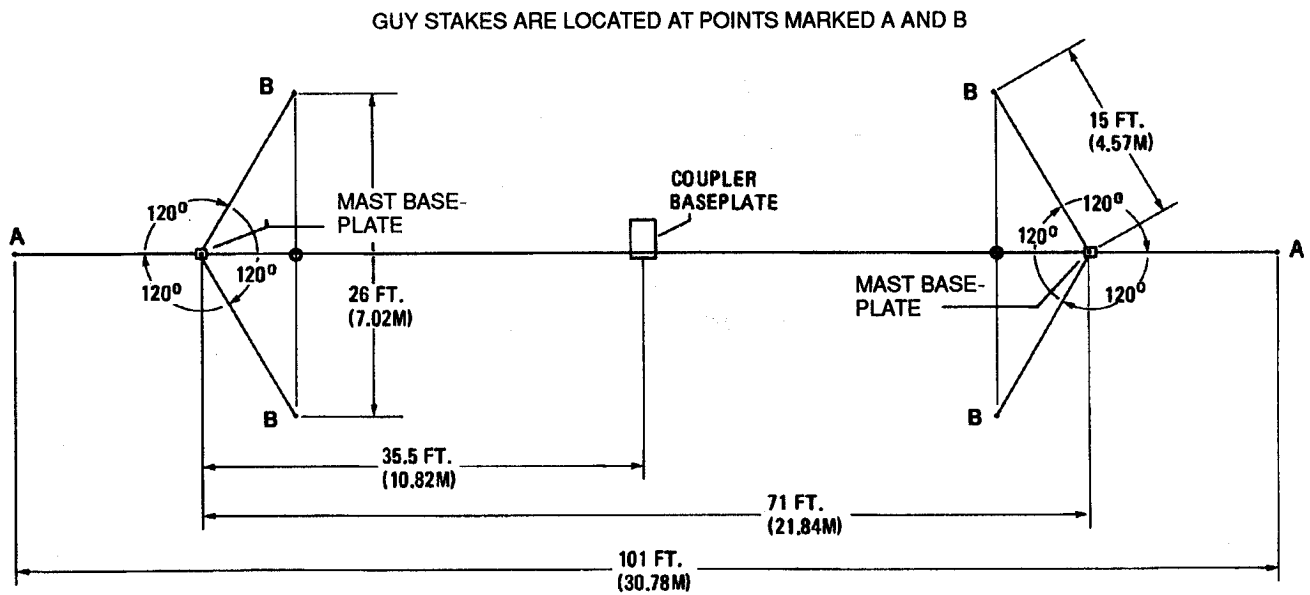


Figure 2-1. RF-1912 Installation Planning Diagram

2.3 TOOLS RECOMMENDED FOR ANTENNA INSTALLATION

Table 2-14 lists the tools recommended for antenna installation.

Table 2-14. Tools Recommended for Antenna Installation

Tool (Harris Part Number)	Tool Use
3 lb. Sledgehammer (10075-0460)	Used to drive in stakes
50 Meter Tape Measure (10075-0459)	Used to measure antenna site orientation
6" Adjustable Wrench (10075-1061)	Used to tighten coupler baseplate ground connections, tighten ground rod clamps, and make the jumper wire connections on the antenna feedline
Lineman's Pliers	Used to cut aluminum ground wire to length
Standard (Flat blade) Screwdriver (Z90-0018-001)	Used to tighten mast pipe clamps

2.4 RF-1912 ANTENNA INSTALLATION

WARNING

The installation of antennas and their associated support structures requires specialized skills. These installations should be made only by personnel experienced in these skills and only after they have thoroughly read and understood the supplied documentation. Failure to do so could result in injury to personnel, both during and after installation, and serious damage to the equipment. Upon request, Harris Corporation can supply training in the techniques required. Harris Corporation assumes no responsibility for any damage or injury that may occur as the result of any installation.

To reduce assembly time, sort parts and set them on the ground near where they will be used. Guy rope assemblies have been color coded (refer to table 2-15), grouped into functional sets, and wound onto color coded cable winders which are stowed in individual canvas bags (one guy set per bag). The dipole assembly has been similarly color coded and wound onto two cable winders (one for each half) which are folded over the center insulator/feedline assembly and stowed in one canvas bag. Note that there are six long stakes to be used at points marked "A" and "B" in figure 2-1 where the site template/guy ropes are to be attached. There are four shorter stakes to be driven through holes in mast baseplates (two in each baseplate), to hold masts securely. Use any necessary tools listed in table 2-14 and perform the following procedure to install the antenna:

WARNING

Use eye protection (safety glasses/safety goggles) to prevent injury to the eye from flying particles.

- a. Unstow and unwind the Site Template Assembly (on black winder in black canvas bag). Attach one end of the template to a guy stake (6906-0250) and drive into the ground at point "A". The top of the stake should tilt away from its respective mast baseplate (see detail B in figure 2-2). Extend the template completely until all sections are straight, without any knots or kinks. Attach the other end of the template to a second guy stake. Pull the center rope to remove all slack, then drive the second guy stake at the other point "A", again tilting the stake back. These two stakes are for the Primary Guy Assemblies. The extended template should look like figure 2-1.

WARNING

Use eye protection (safety glasses/safety goggles) to prevent injury to the eye from flying particles.

- b. See figure 2-1 and attach a guy stake to the four "quick-links" located at point "B". Keeping all ropes straight, drive in the stakes at point "B", again tilting the stakes away from their respective mast baseplates. These four stakes are for the Secondary Guy Assemblies.
- c. Position the two Primary Guy Assemblies (on black winders in yellow canvas bags) at points "A". Position the four Secondary Guy Assemblies (on orange winders in the blue canvas bags) at points "B".
- d. See figure 2-1 and position the two mast baseplates at the indicated point, under the template. Turn mast socket of each baseplate so that its setscrew is facing up, and the mast socket opening faces the other mast baseplate. See detail A in figure 2-2.

WARNING

Use eye protection (safety glasses/safety goggles) to prevent injury to the eye from flying particles.

- e. Drive one mast baseplate stake (6906-0249) through one of the large holes located in opposite corners of each mast baseplate, as shown in figure 2-2, detail B.
- f. See figure 2-1 and position the coupler baseplate and related items at the center of the antenna site. An aluminum ferrule on the template marks this location.
- g. Disconnect the Site Template Assembly from the guy stakes. Coil it up on its black winder and stow away in its black canvas bag.
- h. See detail A in figure 2-3. Remove the shipping cotter pin from each mast assembly. Extend inner mast sections out of assembly, as shown in detail B. Completely extend the masts.

WARNING

Use eye protection (safety glasses/safety goggles) to prevent injury to the eye from flying particles.

- i. Insert bottom end of each mast assembly completely into sockets. Rotate mast sections so that all holes (B through G) are facing up. Align the two masts as shown in figure 2-3, detail C. Drive one mast baseplate stake through the remaining large hole located in the opposite corner of each baseplate.
- j. The mast hardware (from Mast Assembly Kit 6906-0100) should be installed on each mast, in the order/color indicated in table 2-16. See figure 2-4 to identify parts. Inspect mast assemblies for loose hardware; every clamp should be tightened securely.
- k. Rotate each mast so the eyenut is on the top side of the mast.
- l. Tighten each mast socket set screw snugly. **DO NOT OVER-TIGHTEN.**
- m. See figures 2-5, 2-6, and table 2-17 and perform the following procedure to attach guy ropes to mast assemblies:
 - 1. Unstow and carefully unwind the four Secondary Guy Assemblies (at points "B") and attach them to the masts, being sure to match the color and position (for Upper Guy attachment, see figure 2-8). Attach the common carabiners (see figure 2-7) to the guy stakes located at points "B".
 - 2. Unstow and carefully unwind the two Primary Guy Assemblies (at points "A") and attach them to the masts, being sure to match the color and position. The common carabiners (see figure 2-7) will be attached to points "A" after mast erection.
- n. See figures 2-5, 2-8, and table 2-17 and perform the following procedure to attach the dipole assembly to the mast assemblies:
 - 1. Unstow and carefully unfold the two radiating element winders away from the center insulator/feedline assembly.
 - 2. Carefully unwind the radiating elements and attach them to the masts, being sure to match the color and position. The lower radiating elements should be between two adjacent S-Hooks (see figure 2-8). Be careful not to tangle these radiating elements with each other or any of the guy ropes.

WARNING

Contacting the tower with any overhead power line can result in injury or death.

WARNING

Erecting the tower during an electrical storm or under high-wind conditions could be hazardous to personnel.

WARNING

In this section, one installer must hold the tower in its vertical position until the lower guys are tensioned. The use of protective head-gear by installers during this phase of the installation is recommended. Never attempt to climb an unsecured (unguyed) tower.

- o. Raise each mast to a vertical position by lifting from under the mast and pulling out on the remaining three guy ropes. See figure 2-9.
- p. Attach the common carabiner of the Primary Guy Assemblies to the guy stakes at points "A". See figure 2-7.
- q. Adjust guy rope tensioning devices to pull radiator snug, and remove excessive sag from radiator. (See figure 2-7.)

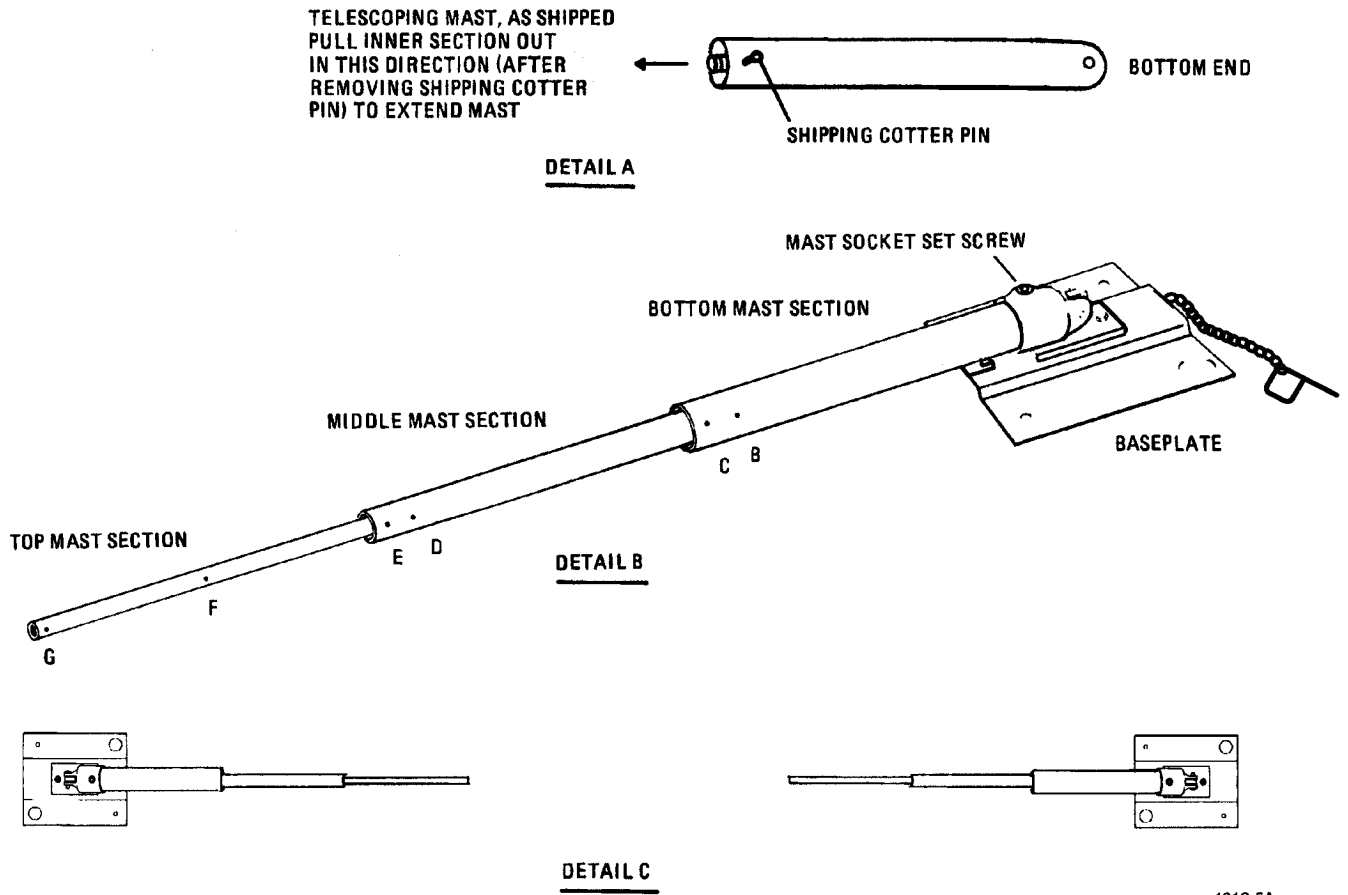
CAUTION

Pulling guy ropes too tight may break radiator assembly; leaving guy ropes too loose will cause masts to be unstable, especially in strong winds.

- r. Mount antenna coupler on coupler baseplate using hardware provided. The terminal on the antenna coupler should face the two eyebolts on the coupler baseplate. Ensure that the antenna is correctly oriented to the baseplate. Correct orientation of the antenna to the baseplate is determined according to which antenna coupler is used. See figures 2-11 and 2-12.

Table 2-15. Canvas Bag/Cable Winder Color Code

Assembly Description (Qty)	Bag Color (Qty)	Winder Color (Qty)
Site Template Assembly (1)	Black (1)	Black (1)
Primary Guy Assembly (2)	Yellow (2)	Black (2)
Secondary Guy Assembly (4)	Blue (4)	Orange (4)
Dipole Assembly (1)	Green (1)	Orange (2)



1912-5A

Figure 2-3. Mast Orientation Diagram

Table 2-16. Mast Hardware Installation (From Mast Assembly Kit 6906-0100)

Item/Color Code	Installation Point
Large Inner Diameter Guy Ring with attached hairpin cotter/Yellow	Until it stops, near Hole "B" – Install with rolled-over edge towards baseplate.
Largest Ring Clamp	Centered over Hole "C"
Medium Ring Clamp	Centered over Hole "E"
Large Inner Diameter Guy Ring with attached hairpin cotter/Blue	Until it stops, near Hole "E" – Install with rolled-over edge towards baseplate.
Small Ring Clamp/Red	Center over Hole "F" and tighten securely.
Small Inner Diameter Guy Ring	Until it stops against last ring clamp – Install with rolled-over edge towards baseplate.
Eyebolt Assembly/Black	Assemble through Hole "G", as shown in figure 2-4. Eyebolt should be oriented as shown. Tighten eyebolt assembly securely.
Hairpin Cotter (Hole "B")	Into Hole "B" – Rotate middle mast section until notched bottom end seats on hairpin cotter. Securely tighten large ring clamp through Hole "C".
Hairpin Cotter (Hole "D")	Into Hole "D" – Rotate top mast section until notched bottom end seats on hairpin cotter. Tighten ring clamp over Hole "E" securely.

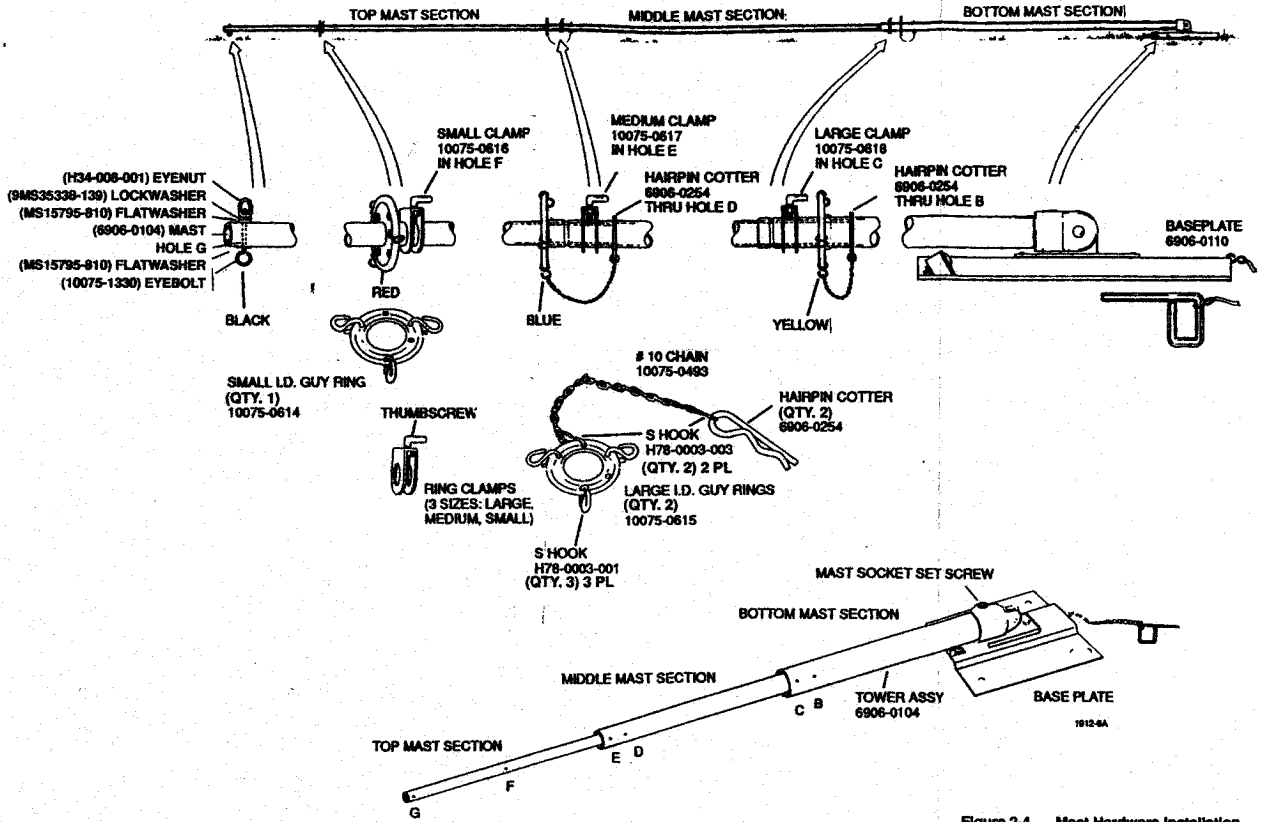
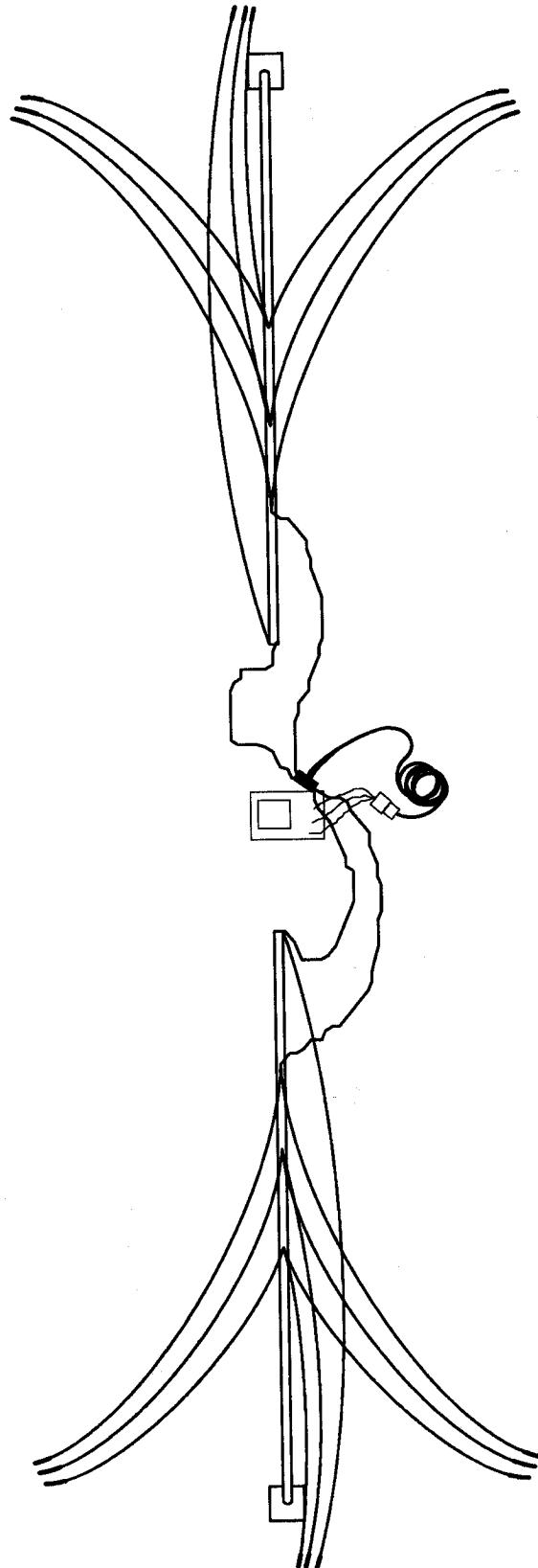
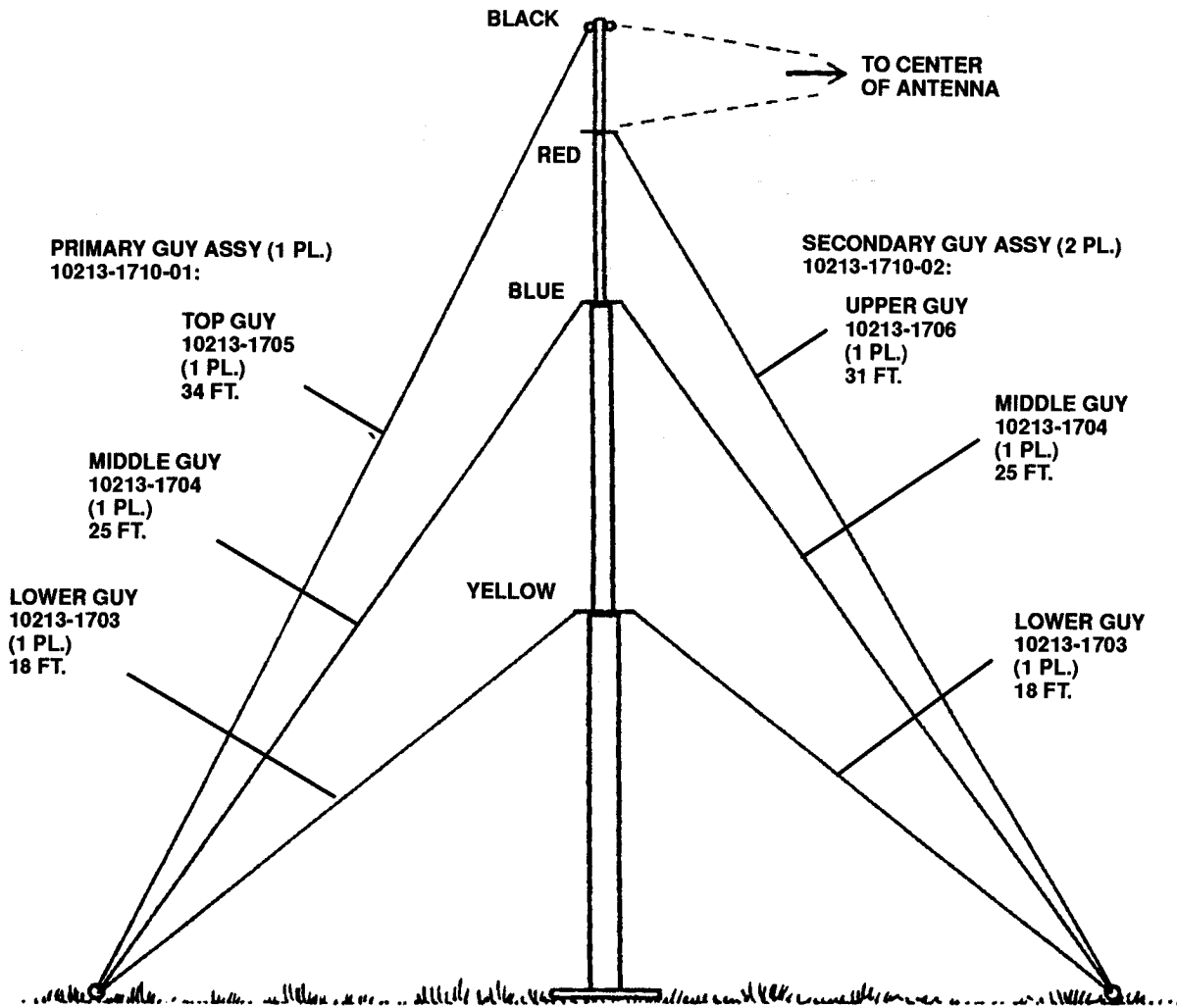


Figure 2-4. Mast Hardware Installation



1912-7A

Figure 2-5. Masts on Ground with Guy Rope Attached



1912-52A

Figure 2-6. Guy Plan

Table 2-17. Guy Assembly/Dipole Assembly Installation

Color Code	Mast Position	Guy Part Number	Radiator Element
Black	Top	10213-1705	Upper
Red	Upper Ring	10213-1706	Lower
Blue	Middle Ring	10213-1704	None
Yellow	Lower Ring	10213-1703	None

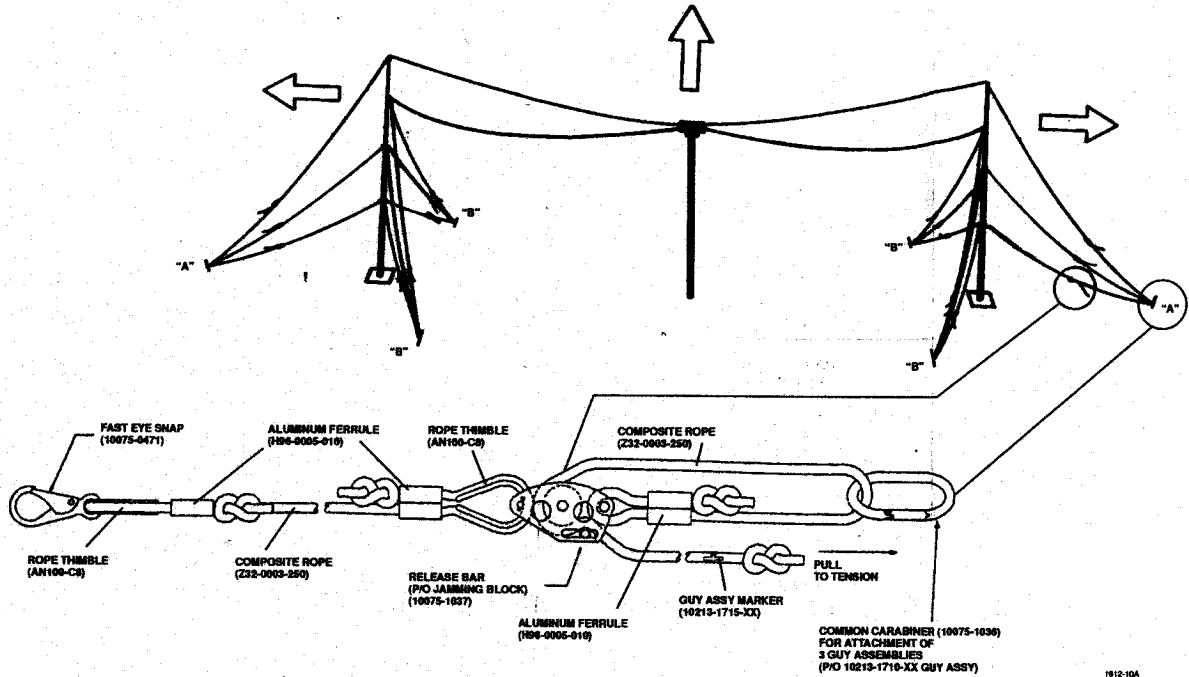


Figure 2-7. Guy Rope Tension Adjustment

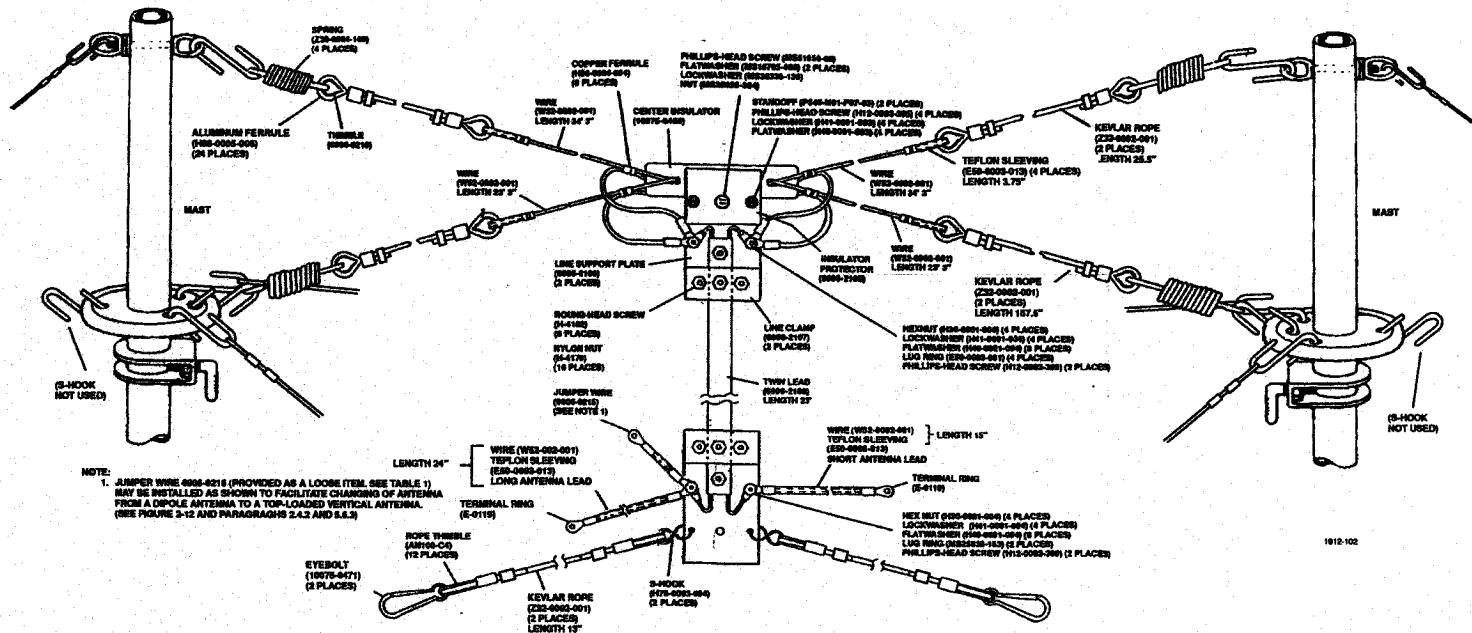


Figure 2-8. Radiating Elements Attached to Masts

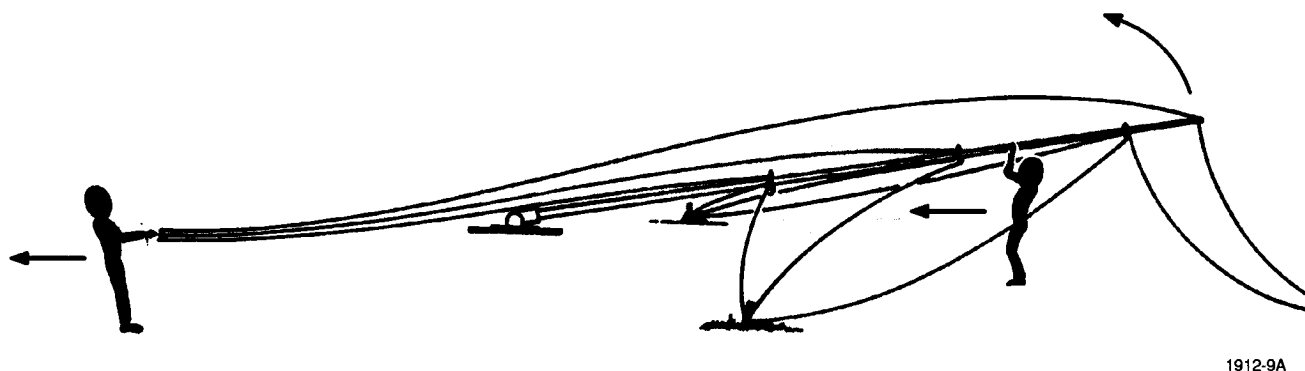


Figure 2-9. Raising a Mast Assembly

2.5 ATTACHING ANTENNA FEEDLINE TO COUPLER

Factors which determine propagation of radio waves include:

- Frequency
- Time of day
- Type of antenna
- Season (to a lesser extent)

A dipole antenna is generally used for coverage of up to 500 miles; signal reception is better at the antenna's broadside. (Refer to the radiation patterns in figure 2-10 for the best signal reception.)

A vertical (Marconi) type antenna is generally used for short-range [up to 50 miles (~80.5 km)] communications with mobile stations or other local base stations because of its omnidirectional properties, or it may be used for very long-range communications [over 500 miles (~804.7 km)]. A good earth ground is important to the performance of the vertical type antenna.

The antenna may be connected in either of two ways: short-to-medium range skywave propagation (see figure 2-11), or short-range groundwave or long-range skywave communications (see figure 2-12).

2.5.1 Short-to-Medium Range Skywave Propagation

For short-to-medium range skywave propagation [up to 500 miles, (804.7 km) preferred mode], the RF-1912 Antenna should be connected as a high radiation angle dipole. Skywave propagation is frequency sensitive. Consult M.U.F. charts for proper frequency to use for time of day and required distance of communication. Connect the short piece of prepared, tinned copper braid (supplied) to the number 10 stud on the coupler baseplate closest to coupler ground terminal. Do not tighten nut. Attach the other end of braid to unpainted foot of the RF-2601 Antenna Coupler (if used), using 3/8-16 x 3/4 inch screw, flatwasher, and lockwasher, and tighten securely. If the RF-382, RF-3281, or RF-3282 Antenna Coupler is used, connect the braid to the ground stud on the coupler below the ceramic antenna terminal insulator. Remove any twists from antenna terminal insulator. Remove any twists from antenna feedline, and attach snap-fasteners at the end of feedline to the two eyebolts on the coupler baseplate, so that the feedline terminal strip screws face the antenna coupler.

Perform the following procedures for connection as a high radiation angle dipole:

WARNING

Verify that the transmitter power is off before proceeding with antenna assembly. Electrical burns will result if contact is made with the antenna when the transmitter is keyed.

- a. Run the longer of the two wires at the bottom of the feedline through the coupler baseplate eyebolt which is closest to the number 10 stud (where the coupler ground strap should also be). Attach the wire to the number 10 stud, but do not tighten (to be tightened when the coupler is grounded).
- b. When using the RF-2601 Antenna Coupler, connect the shorter wire from the feedline to the RF-2601 Antenna Insulator.
- c. When using the RF-382, RF-3281, or RF-3282 Antenna Coupler, connect the shorter wire from the feedline to the antenna terminal.
- d. Move coupler and baseplate as required to remove slack in the feedline. Verify that there are no electrical connections which will short out as the feedline sways back and forth in windy conditions.

2.5.2 Short-Range Groundwave or Long-Range Skywave Communications

For short-range groundwave or long-range skywave communications, the RF-1912 should be connected as a top-loaded vertical antenna. This hookup is advantageous for short-range communications with mobile stations and communications above 500 miles (804.7 km). A good earth ground is essential. See figure 2-12.

Perform the following procedure for connection as a top-loaded vertical antenna:

WARNING

Verify that the transmitter power is off before proceeding with antenna assembly. Electrical burns will result if contact is made with the antenna when the transmitter is keyed.

- a. Connect the short piece of prepared, tinned copper braid (supplied) to the number 10 stud on the coupler baseplate closest to the coupler terminal. Attach the other end of braid to the unpainted foot of the RF-2601 Antenna Coupler, using a 3/8-16 x3/4 inch screw, flatwasher, and lockwasher, and tighten firmly. If the RF-382, RF-3281, or RF-3282 Antenna Coupler is used, connect the braid to the coupler ground stud, close to the antenna terminal.
- b. Remove any twists from the antenna feedline, and attach the snap-fasteners at the bottom end of the feedline to the two eyebolts on the coupler baseplate, so that the feedline terminal strip screws face toward the antenna coupler.
- c. Disconnect and remove the longer of the two wires from the terminal strip at the bottom of the feedline. Use wire jumper supplied (6906-0215) to connect these two screws together. See figures 2-8 and 2-12.
- d. When using the RF-2601 Antenna Coupler, connect the wire from the feedline terminal strip to the antenna insulator.
- e. When using the RF-382, RF-3281, or RF-3282 Antenna Coupler, connect the wire from the feedline terminal strip screws to the antenna terminal. The two screws on the feedline terminal strip should be shorted together with the wire jumper supplied.
- f. Move coupler and baseplate as required to remove slack in the feedline. Verify that there are no electrical connections which will short out as the feedline sways back and forth in windy conditions.

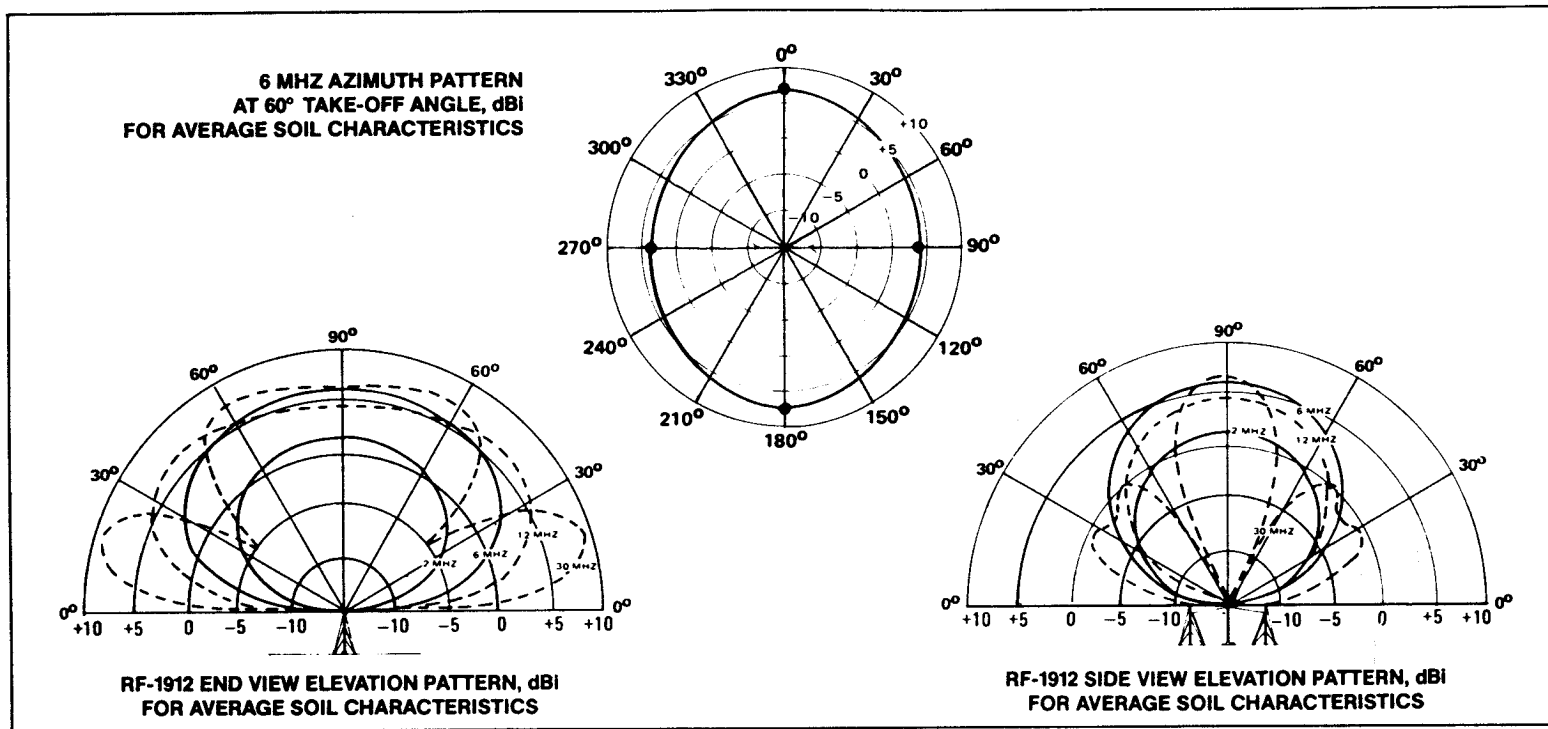


Figure 2-10. RF-1912/RF-1912A Signal Patterns

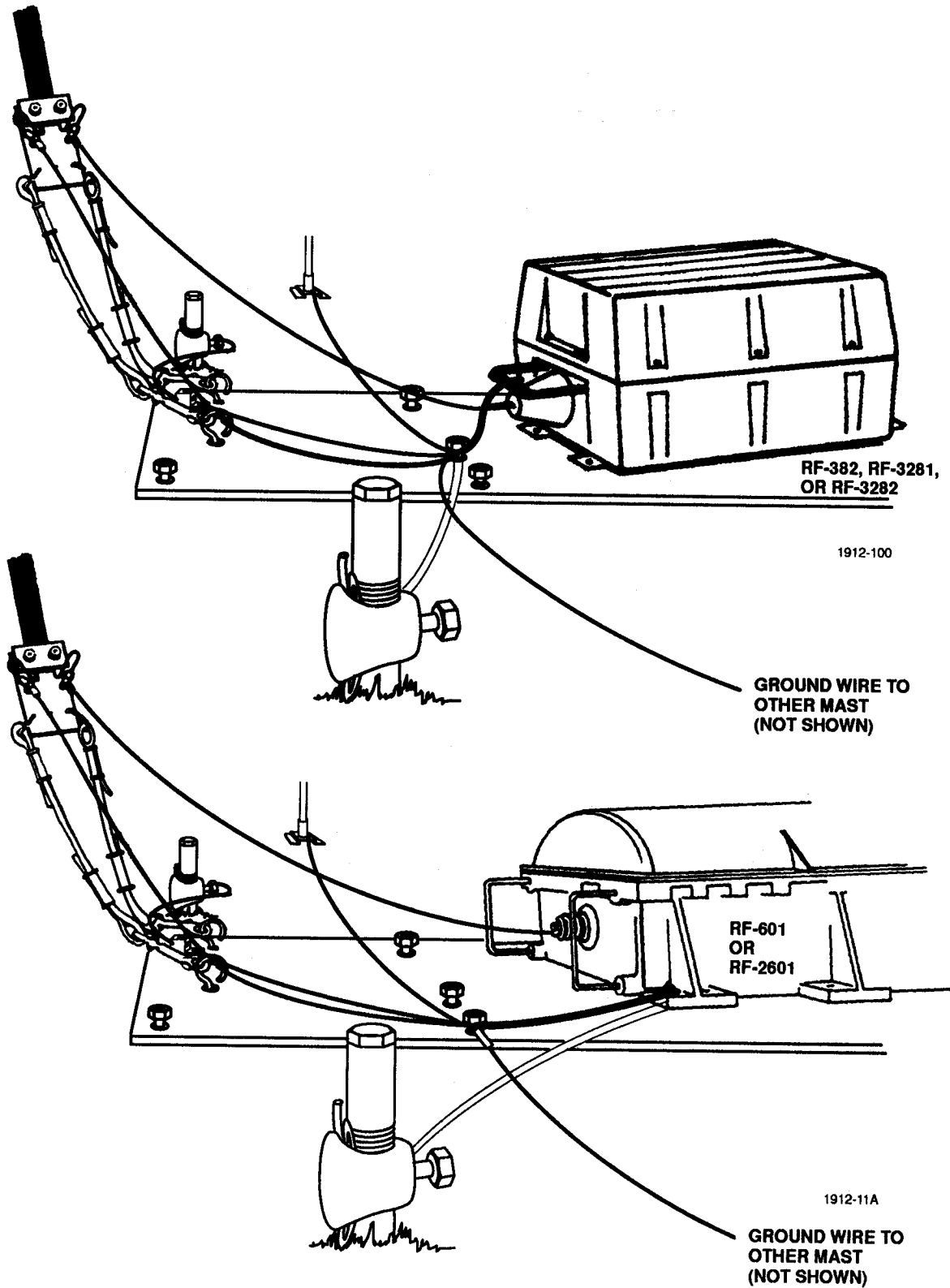


Figure 2-11. High-Angle Dipole Connections

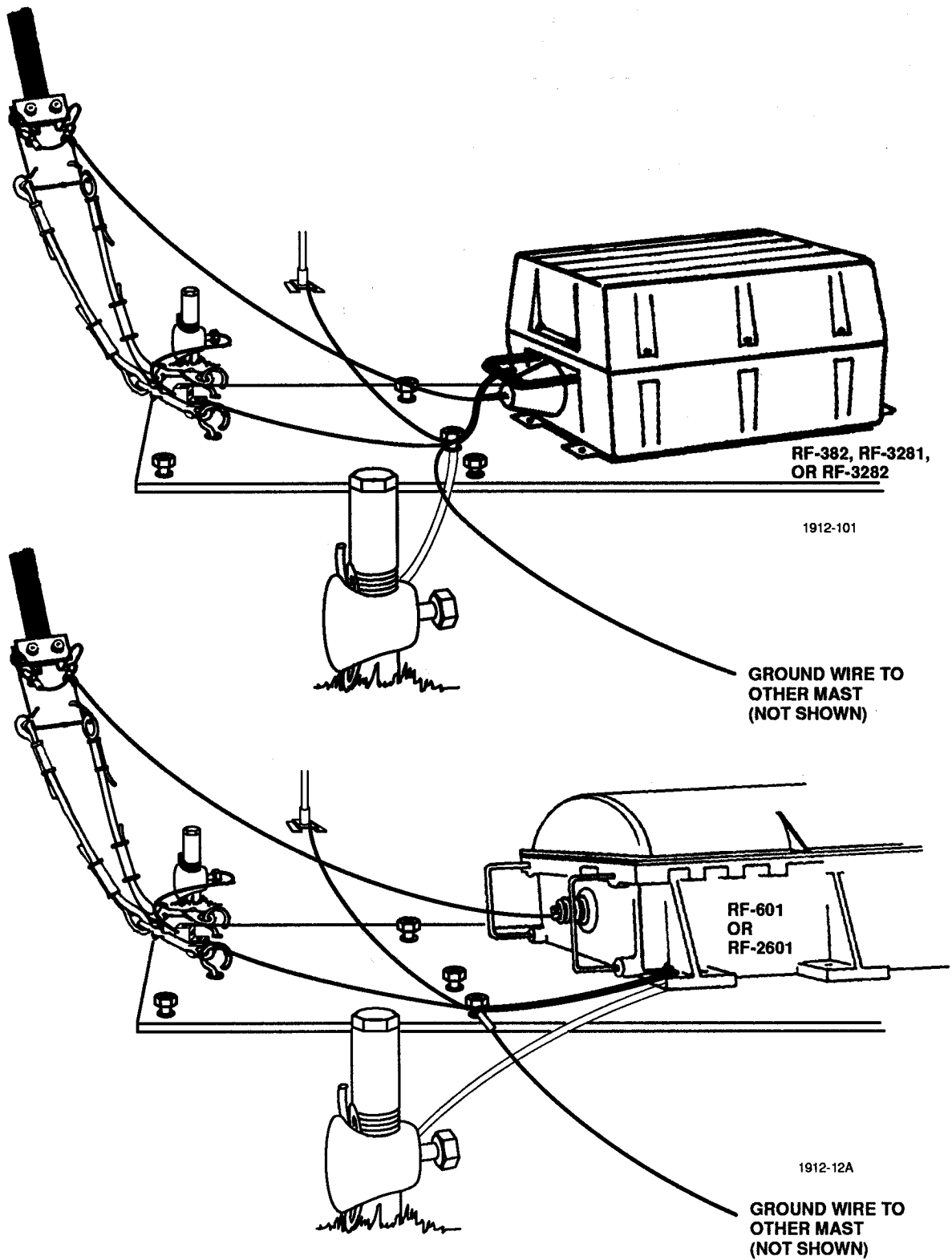


Figure 2-12. Top-Loaded Vertical Mode Connections

2.6 GROUND SYSTEM INSTALLATION

Perform the following procedure for ground system installation:

- a. There are two bronze pipe clamps supplied to provide a good electrical ground to the antenna masts. Attach one several inches above both mast sockets, around each mast, as shown in figure 2-13. Securely tighten the two clamp screws.
- b. Attach the supplied aluminum ground wire from each pipe clamp to mast baseplates and to coupler baseplate. Use lugs on the baseplates, as shown in figure 2-13. Verify that all grounding lugs, except coupler baseplate lug, are securely tightened.

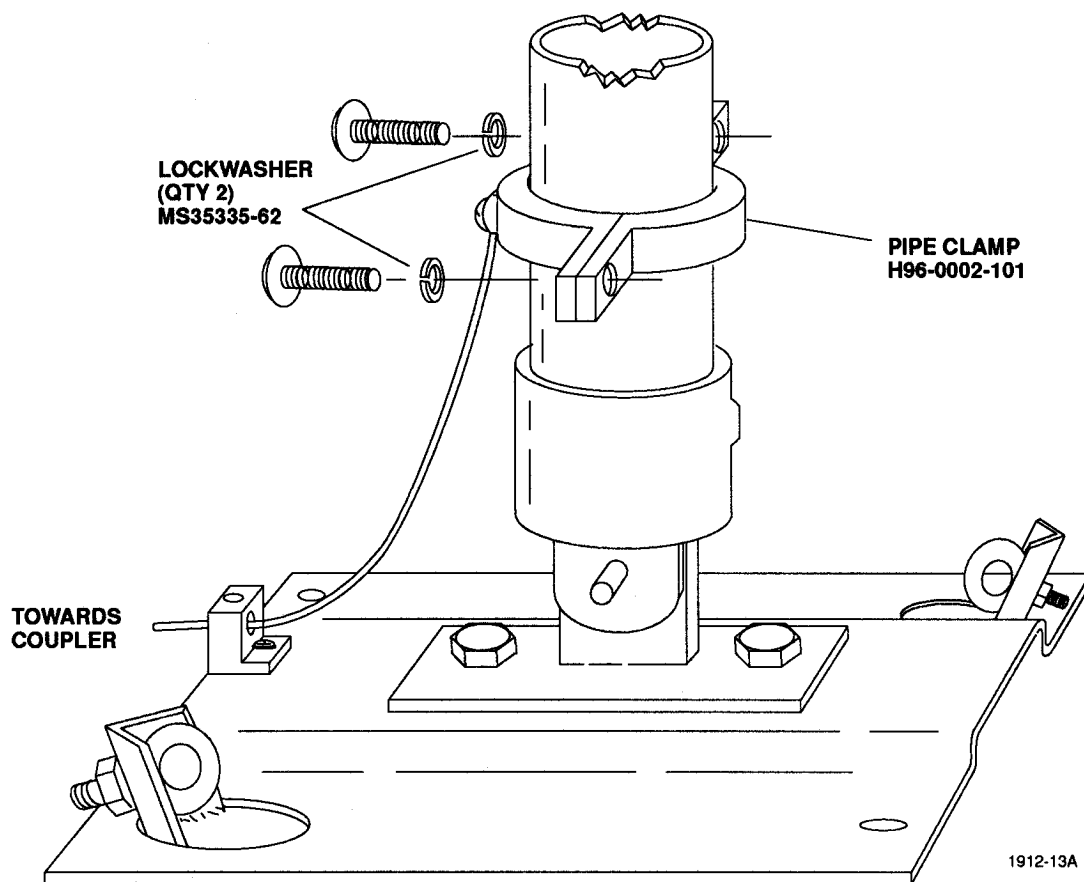


Figure 2-13. Antenna Mast Grounding Clamp

2.6.1 Grounding the Coupler

Perform the following procedure to ground the coupler:

WARNING

Use eye protection (safety glasses/safety goggles) to prevent injury to the eye from flying particles.

- a. Drive ground rod by coupler baseplate. Drive the two sectional ground rods into the earth, close to the coupler baseplate. Be careful not to strike the coupler while driving ground rods. It is preferable to use both ground rods with a coupling attached in the middle for an effective depth of about 11 feet (3.4m). If the earth is too rocky to drive both rods in series, it is acceptable to drive the rods in separately. Drive them into the ground at opposite corners of the coupler baseplate, about 5 feet (1.52m) away from each other. When driving the rods, use coupling and driving stud provided to prevent damaging the rods. See figure 2-11.

WARNING

Use eye protection (safety glasses/safety goggles) to prevent injury to the eye from flying particles.

- b. The RF-1913 installation kit contains a sledgehammer for driving the stakes and ground rods. If there is no sledgehammer available, or if it is difficult to start the ground rod, cap one end of a 3 foot length of 1-1/2 inch diameter water pipe (not supplied). Slide this pipe over the top of the ground rod. See figure 2-14. Raise and forcefully lower this water pipe repeatedly, while still encasing ground rod to drive it into the ground.
- c. Attach aluminum wire to the ground rods using ground clamps provided. Attach other end of aluminum wire to number 10 stud on coupler baseplate and tighten securely. Keep aluminum wire as short as possible between coupler baseplate and ground rods.
- d. Recheck all hardware to ensure that all electrical and mechanical connections are secure.

2.7 SOIL TREATING FOR IMPROVED PERFORMANCE

WARNING

Care should be taken to prevent chemicals from entering nearby drinking water supplies.

If the RF-1912 Antenna is erected for more than three days, its performance and safety are improved by chemically treating the soil around the ground rods. When time permits, and especially when the antenna is connected in the top-loaded vertical mode, the soil around the ground rods should be chemically treated as follows:

- a. Dissolve at least five pounds (2.27 kg) of magnesium sulfate (Epsom Salts) in water.
- b. Pour the solution close to the ground rods.
- c. Continue to soak the treated soil with water until it becomes muddy, with a puddle on the surface. This will normally require at least 6 gallons (22.7 liters) of water.

This completes the installation of the RF-1912 Antenna.

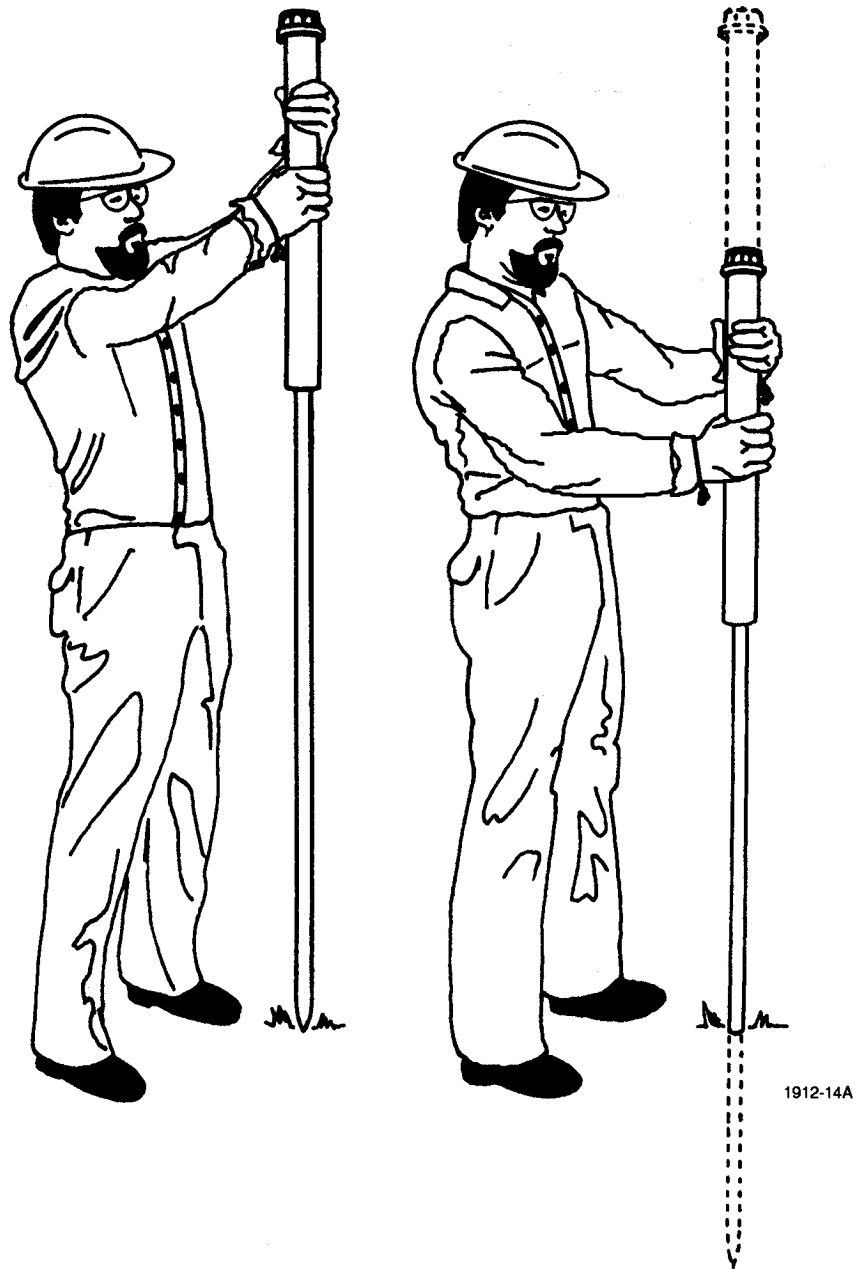


Figure 2-14. Driving Ground Rod With Water Pipe

SECTION 3

RF-1912 ANTENNA REMOVAL

3.1 GENERAL

To increase safety and reduce disassembly time, sort canvas bags and winders and set them on the ground near where they will be needed. Also, remember to relocate all removed items away from the antenna site so as to keep a clear, open area for lowering the masts.

3.2 GROUND SYSTEM REMOVAL

Perform the following procedure to remove the ground system:

- a. Remove aluminum wire from ground rod clamps and mast pipe clamps. Coil up wire and relocate away from the antenna site for future packing.
- b. Remove ground rods and relocate them away from the antenna site for future packing.

3.3 ANTENNA COUPLER/BASEPLATE REMOVAL

Perform the following procedure to remove the antenna coupler and baseplate:

WARNING

Verify that the transmitter power is off before proceeding with antenna disassembly. Electrical burns will result if contact is made with the antenna when the transmitter is keyed.

- a. Disconnect the RF coaxial cable and coupler control cable to the antenna coupler.
- b. Disconnect the dipole assembly feedline connections to the antenna coupler.
- c. Relocate the antenna coupler (mounted on baseplate) away from the antenna site.

3.4 ANTENNA MAST/DIPOLE ASSEMBLY REMOVAL

Refer to Section 2, tables 2-14 and 2-16, and perform the following procedure to remove antenna masts and the dipole assembly:

WARNING

Lowering the tower during an electrical storm or under high-wind conditions could be hazardous to personnel.

WARNING

In this section, one installer must hold the tower in its vertical position while the guy tension is released. The use of protective head-gear by installers during this phase of the installation is recommended. Never attempt to climb an unsecured (unguyed) tower.

- a. With one person holding the mast erect, a second person carefully releases tension on the Primary guy ropes.
- b. With tension on the guy ropes released, carefully lower the antenna mast by reversing the procedure used in Section 2, step 2.3 (o).

- c. Repeat steps a. and b. for the other mast.
- d. With the antenna masts lowered, disconnect the dipole assembly, coiling a long and a short radiating element onto one orange winder. Coil the other long and short radiating elements onto the second orange winder. Coil up the center insulator/feedline assembly and fold radiating elements around it. Stow the dipole assembly away in its green canvas bag for future packing.
- e. With the dipole assembly removed, disconnect the Primary Guy Assemblies from the masts, coil up on their black winders, and stow away in their yellow canvas bags for future packing.
- f. Disconnect the Secondary Guy Assemblies from the masts, coil up on their orange winders, and stow away in their blue bags for future packing.
- g. With the guy assemblies disconnected, loosen the mast baseplate set screw and relocate masts away from the antenna site for future packing.
- h. Remove masts stakes, guy stakes, and mast baseplates. Relocate them away from the antenna site for future packing.

SECTION 4

PACKING THE RF-1912 FOR TRANSPORTATION

4.1 PACKING EQUIPMENT

Three canvas bags are provided for packing the RF-1912 Antenna. One is a small, flat envelope; the second is a narrow bag about ten feet long; the third is a suitcase-like bag with two carrying handles.

Perform the following procedure to pack the RF-1912 Antenna for transportation:

- a. Position the two mast baseplates back-to-back, and slide them into the canvas envelope.
- b. Place the packed canvas envelope bag in the bottom of the suitcase-like bag.
- c. Next, place the coiled aluminum wire and the RF-1912 Spares Kit in the suitcase-like bag.
- d. Place the dipole assembly (in the green canvas bag) on top of the envelope bag.
- e. Place the two Primary Guy Assemblies (in the yellow canvas bags) on top of the envelope bag, next to the dipole assembly.
- f. Place the four Secondary Guy Assemblies (in the blue canvas bags) on top of the Primary Guy Assemblies.
- g. Lastly, place the Site Template Assembly (in the black canvas bag) and installation manual in the suitcase-like bag.
- h. Pack the two steel masts and the long, copper ground rods (with the ground clamps, couplings, and driving stud) in the ten-foot long canvas bag.

The RF-1912 Antenna is now ready for transportation.

NOTE

If shipping permits, it will not be necessary to remove the guy rings, clamps, and associated hardware from the masts; the parts can be left on the masts when they are collapsed.