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RF-291 ANTENNA

INSTRUCTION MANUAL

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RF-291-AT001 BROADBAND DISCONE ANTENNA

1. INTRODUCTION

The Harris RF-291-AT001 Broadband Discone Antenna (hereafter referred to as RF-291 Antenna) is an omnidirectional transportable antenna designed for operation from 100 MHz to 512 MHz. The wide bandwidth allows operation across the Very High Frequency (VHF) and Ultra High Frequency (UHF) bands, making it suitable for use with Harris multiband radios.

2. SAFETY PRECAUTIONS

All safety precautions necessary for the protection of personnel and equipment are cross-referenced in the following list. The WARNING is referenced to the paragraph number where it is used in the manual, and a brief subject phrase indicating the content provided. Read these items in their entirety before performing the referenced procedure.

- WARNING - Paragraph 6. - Two people are recommended to deploy the RF-291.
- WARNING - Paragraph 6. - Do not touch electrical lines with any antenna part.
- WARNING - Paragraph 6. - Do not erect antenna during electrical storm.
- WARNING - Paragraph 6. - Install adequate radio system grounding.
- WARNING - Paragraph 6.1 - Failure to fasten mast base securely to the anchor stake may cause the mast to slip.

3. FEATURES

The RF-291 Antenna incorporates the following features:

- Extended bandwidth eliminates the need for multiple antennas.
- Tall mast extends Line-of-Sight (LOS) range.
- Simple setup and teardown: 15 minutes with two persons.

4. SUPPLIED PARTS LIST

Table 1 lists the parts supplied with the RF-291 Antenna Kit.

Table 1. RF-291 Supplied Parts

Item	Harris Part Number	Description	Qty
1	12006-2200-01	Antenna Assembly, Flat Black	1
2	E75-0020-101	Antenna Mast	1
3	E75-0020-901	Mast Adapter	1
4	12006-2010-A24	Cable, N-male to BNC-female, 2 ft.	1
5	p/o E75-0020-101	Cable extension, BNC-male to BNC-male, 50 ft. (Includes BNC-female to BNC-female adapter)	3
6	12006-2002-01	Antenna Carrying Bag (nylon, black w/straps)	1

Table 1. RF-291 Supplied Parts (Continued)

Item	Harris Part Number	Description	Qty
7	Z90-0030-001	Mini Strap Wrench	1
8	P40-0003-104	Never-Seez® lubricating compound	1
9	10515-0216-4200	Instruction Manual	1

5. SPECIFICATIONS

Table 2 defines the product specifications for the RF-291 Antenna.

Table 2. RF-291 Specifications

Electrical	
Frequency Range	100 - 512 MHz
Polarization	Vertical
Impedance	50 ohms nominal
VSWR	< 2.5:1
Gain	> 2 dBi
Power Rating	350 watts continuous
Matching	None required
Radiation Pattern	Omni-directional

Table 2. RF-291 Specifications (Continued)

Mechanical	
Height	Deployed: 8.8 meters (29 ft.) with mast fully extended Antenna w/o mast: 1 meter (3.3 ft.)
Weight	Complete kit: 21 kg (46 lb) Antenna only: 5.4 kg (12 lb)
RF Connection	Antenna connector: Type “N” “N” to BNC adapter cable and extension cables included; mates with RF-5800M and AN/PRC-117F radios (BNC-female jack on radios)
Transport Bag Dimensions	1.2 m x 0.3 m x 0.3 m (4 ft. x 1 ft. x 1 ft.)
Color	Antenna: Black Carrying bag: Black

6. SETUP AND TEARDOWN

This section describes the procedure for deployment of the antenna system. Refer to Table 3 for items described in Paragraph 6.1. See Figure 1, Figure 2, and Figure 3 for setup details.

WARNING

Two people are recommended to safely and successfully deploy an RF-291 Antenna. Failure to do so could cause injury or death.

WARNING

The antenna height is approximately 30 ft. when raised. Be aware of the overhead clearance requirements. Do NOT set up near power lines or other potentially hazardous devices.

WARNING

Erecting antenna during electrical storm could result in injury or death.

WARNING

Inadequate grounding of radio system could result in equipment damage, personal injury, or death.

Table 3. Itemized Parts

Item	Description	Qty
1	Antenna radiating element, 1 ft.	12
2	Antenna reflecting element, 3 ft.	12
3	Antenna Hub	1
4	Antenna Mast section, 4 ft.	7
5	Mast Adapter	1

Table 3. Itemized Parts (Continued)

Item	Description	Qty
6	Cable, N-male to BNC-female, 2 ft.	1
7	Cable extension, BNC-male to BNC-male, 50 ft. (Includes BNC-female to BNC-female adapter)	3
8	Anchor stake	5
9	Guy line with clips	4
10	Antenna Carrying Bag (nylon, black w/straps)	1
11	Mini Strap Wrench	1
12	Never-Seez® lubricating compound (4 oz.)	1
13	Instruction Manual	1
14	Mast Base	1
15	Hammer	1
16	Cable Clip Ring	1

6.1 Antenna Setup

For ease of deployment, Harris recommends two people to set up the antenna. See Figure 1 and Figure 2. Perform the following procedure to assemble the antenna system:

a. Assemble all seven mast sections (Item 4) together to obtain maximum height, as shown in Figure 1. The antenna mast may be shortened depending on the environment or tactical situation, but best communication results are obtained with full height. The sections slide together and are held firmly in place when the antenna is deployed.

b. Attach coax cable (Item 6) to the N-type connector on the bottom of the antenna hub (Item 3). See Figure 2.

c. Feed the cable (Item 6) through the threaded hole at the top of the mast adapter (Item 5), and out the hole in the side. Apply a small amount of Never-Seez® (Item 12) to the threads on the mast adapter (optional). Carefully thread the mast adapter onto the bottom of the antenna hub.

NOTE

Do not use Never-Seez® lubricant on RF connectors.

d. (Optional Step) Apply a small amount of the supplied Never-Seez® lubricant (Item 12) to the threads of the twelve 3-foot long antenna elements (Item 2), as shown in Figure 2. This will prevent pitting and galling of the threads and make disassembly easier.

e. Install the twelve 3-foot elements (Item 2) into the holes in the bottom ("N" connector side) of the antenna hub (Item 3). Tighten the elements using the strap wrench (Item 11) until snug - DO NOT OVERTIGHTEN.

f. Repeat Step b with the twelve 1-foot elements (Item 1) and install them in the top of the antenna hub (Item 3). Tighten the elements using the strap wrench (Item 11) until snug - DO NOT OVERTIGHTEN.

g. Slide the mast adapter/antenna assembly onto the top of the mast, and clip the four guy lines (Item 9) to the anchor ring on the mast adapter.

h. Attach one of the three extender cables (Item 7) to the antenna cable (Item 6). Secure this cable to the mast using the clips on the cable.

i. Guy stakes are anchored at four equally spaced places on an approximate 28-ft. radius circle from the mast base (Item 14).

j. Connect two guy lines to stakes on either side of the mast.

k. Drive the fifth stake into the ground at the desired mast base location. Using the rope loop attached to the mast base, attach the mast base (Item 14) securely to this stake by pushing the loop through a hole in the stake and looping it back over the top of the stake and pulling it tightly to positively secure the mast base to the stake.

WARNING

Failure to fasten mast base securely to the anchor stake may cause the mast to slip, possibly causing injury from the mast or anchor points on the bottom of the base.

l. Hoist the antenna mast into a vertical position, and secure the other two guy lines to anchor stakes (Item 8). See Figure 3.

m. Adjust the guy lines to keep the mast vertical. Make sure that the guy lines do not interfere with the 3-ft. cone elements.

n. The antenna is now fully deployed and ready for connection to the radio.

NOTE

If the ground is soft, it may be necessary to place a hard surface such as a board under the mast base to reduce sinking of the base into the ground.

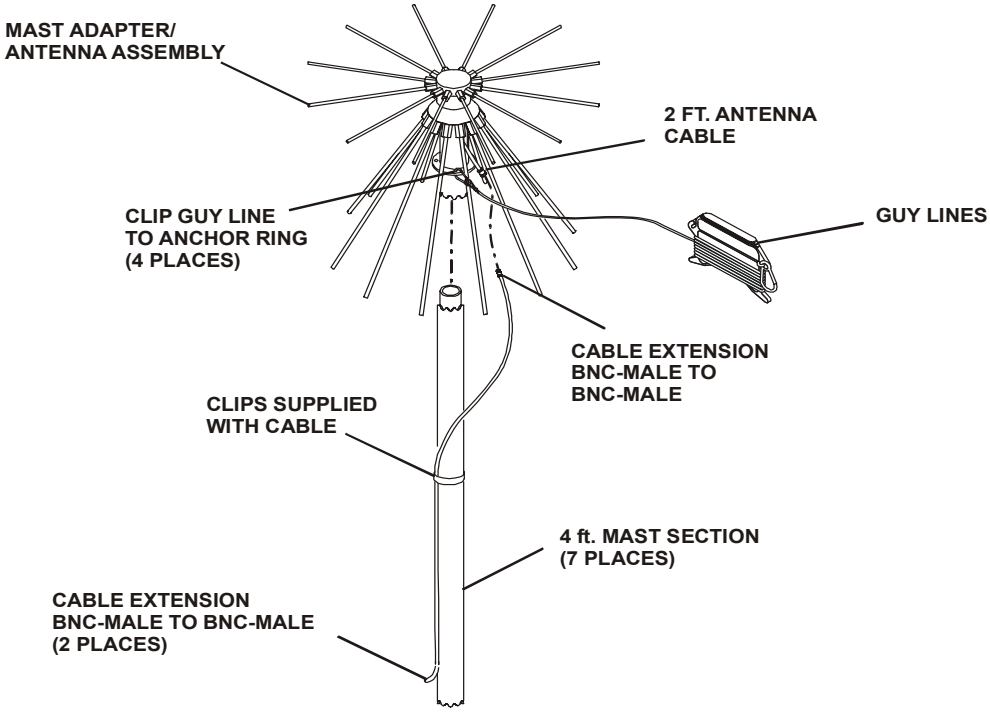

Figure 1. RF-291 Antenna System

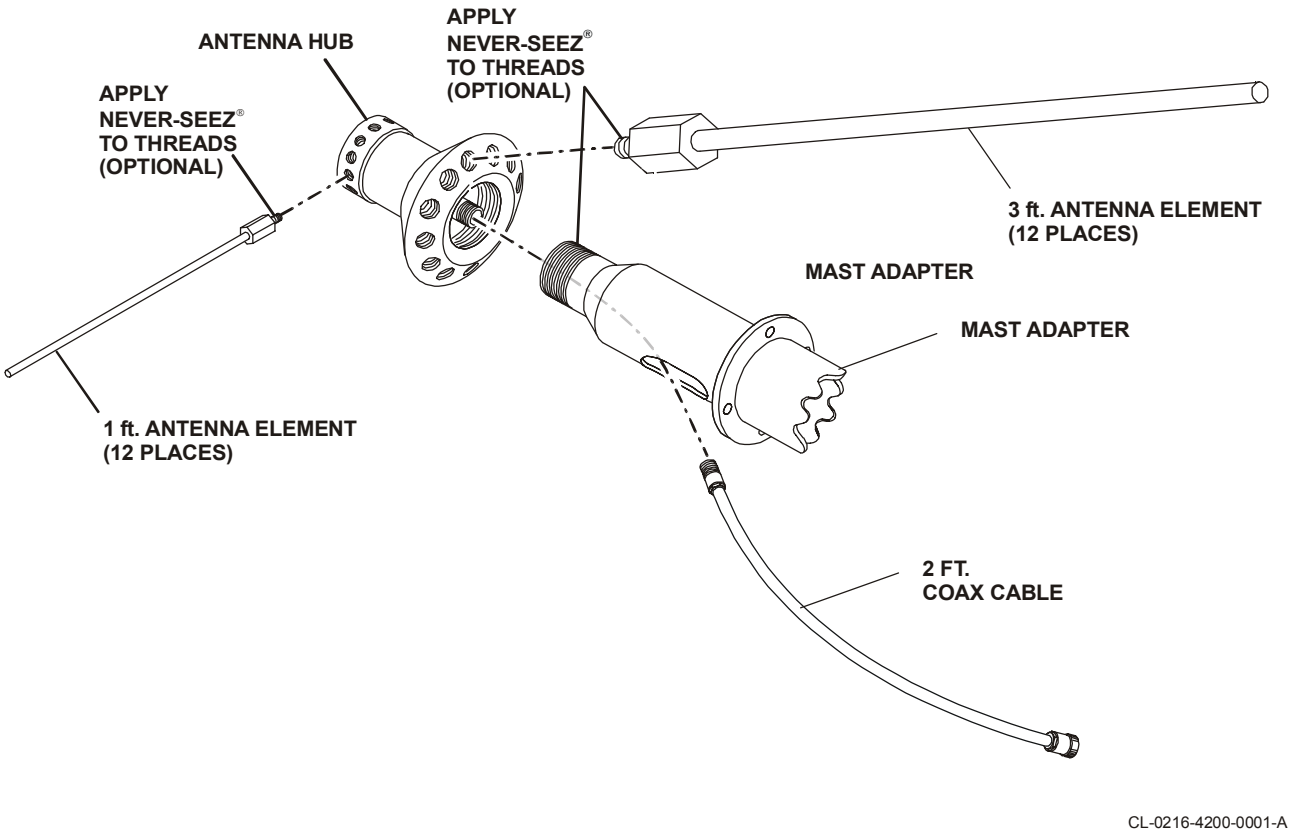

Figure 2. Antenna Assembly

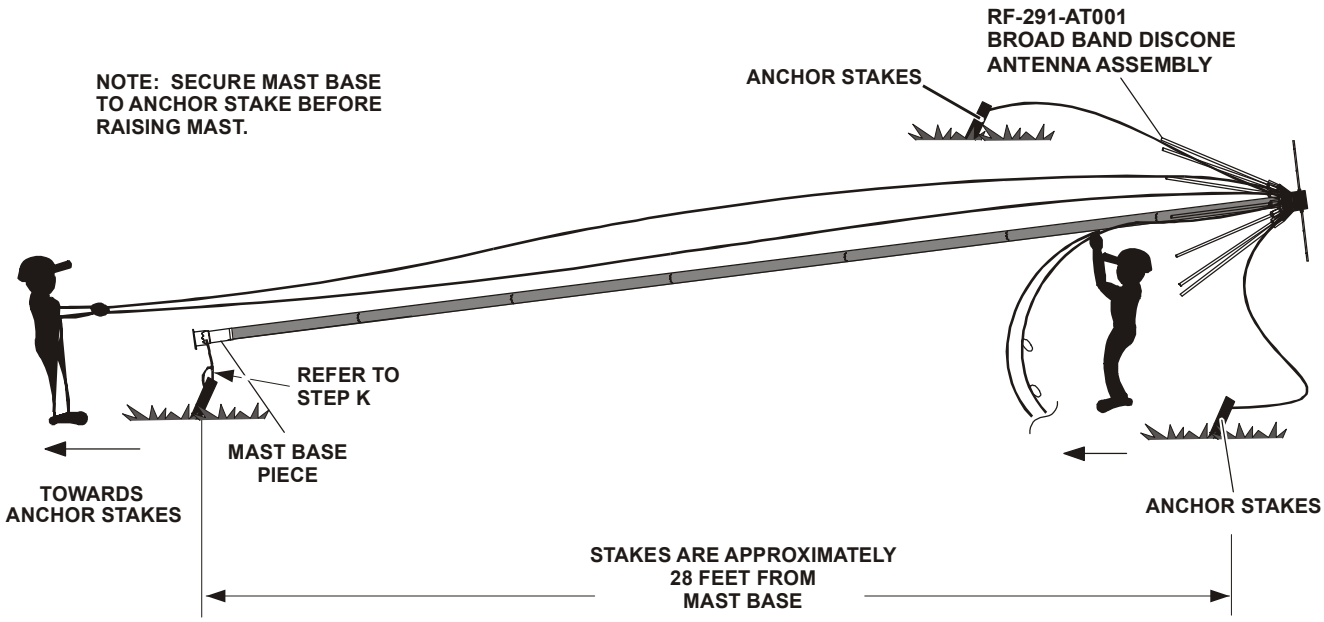

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Figure 3. Raising the Antenna System

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