



HARRIS

RF COMMUNICATIONS

SB-V35S/HD HF WHIP ANTENNA INSTRUCTION MANUAL



**LIMITED ONE YEAR WARRANTY
HARRIS CORPORATION (RF COMMUNICATIONS DIVISION)**

FROM HARRIS TO YOU – This warranty is extended to the original buyer and applies to all Harris Corporation, RF Communications Division equipment purchased and employed for the service normally intended, except those products specifically excluded.

WHAT WE WILL DO – If your Harris Corporation, RF Communications Division equipment purchased from us for use outside the United States fails in normal use because of a defect in workmanship or materials within one year from the date of shipment, we will repair or replace (at our option) the equipment or part without charge to you, at our factory. If the product was purchased for use in the United States, we will repair or replace (at our option) the equipment or part without charge to you at our Authorized Repair Center or factory.

WHAT YOU MUST DO – You must notify us promptly of a defect within one year from date of shipment. Assuming that Harris concurs that the complaint is valid, and is unable to correct the problem without having the equipment shipped to Harris:

- Customers with equipment purchased for use outside the United States will be supplied with information for the return of the defective equipment or part to our factory in Rochester, NY, U.S.A., for repair or replacement. You must prepay all transportation, insurance, duty and customs charges. We will pay for return to you of the repaired/replaced equipment or part, C.I.F. destination; you must pay any duty, taxes or customs charges.
- Customers with equipment purchased for use in the United States must obtain a Return Authorization Number, properly pack, insure, prepay the shipping charges and ship the defective equipment or part to our factory or to the Authorized Warranty Repair Center indicated by us.

Harris Corporation
RF Communications Division
Customer Service
1680 University Avenue
Rochester, NY 14610, U.S.A.

Telephone: (716) 244-5830
Telex: 240313
Cable: RFCOM

Harris will repair or replace the defective equipment or part and pay for its return to you, provided the repair or replacement is due to a cause covered by this warranty.

WHAT IS NOT COVERED – We regret that we cannot be responsible for:

- Defects or failures caused by buyer or user abuse or misuse.
- Defects or failures caused by unauthorized attempts to repair or alter the equipment in any way.
- Consequential damages incurred by a buyer or user from any cause whatsoever, including, but not limited to transportation, non-Harris repair or service costs, downtime costs, costs for substituting equipment or loss of anticipated profits or revenue.
- The performance of the equipment when used in combination with equipment not purchased from Harris.
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SERVICE WARRANTY – Any repair service performed by Harris under this limited warranty is warranted to be free from defects in material or workmanship for sixty days from date of repair. All terms and exclusions of this limited warranty apply to the service warranty.

IMPORTANT – Customers who purchased equipment for use in the United States must obtain a Return Authorization Number before shipping the defective equipment to us. Failure to obtain a Return Authorization Number before shipment may result in a delay in the repair/replacement and return of your equipment.

IF YOU HAVE ANY QUESTIONS – Concerning this warranty or equipment sales or services, please contact our Customer Service Department.

SB-V35S/HD HF ANTENNA SYSTEM INSTRUCTION MANUAL

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When an Adult Stops Breathing

WARNING

DO NOT attempt to perform the rescue breathing techniques provided on this page, unless certified. Performance of these techniques by uncertified personnel could result in further injury or death to the victim.

1 Does the Person Respond?

- Tap or gently shake victim.
- Shout, "Are you OK?"

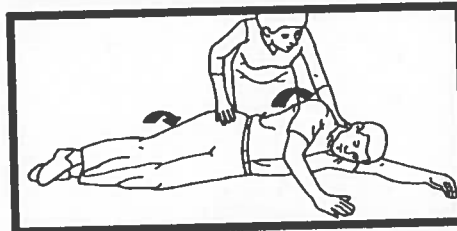


2 Shout, "Help!"

- Call people who can phone for help.

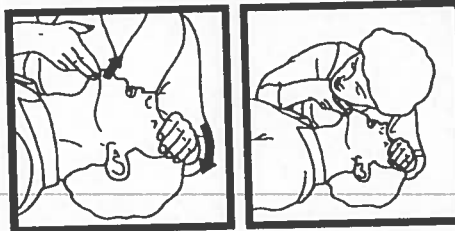
3 Roll Person Onto Back

- Roll victim toward you by pulling slowly.



4 Open Airway

- Tilt head back and lift chin.



5 Check for Breathing

- Look, listen, and feel for breathing for 3 to 5 seconds.

6 Give 2 Full Breaths

- Keep head tilted back.
- Pinch nose shut.
- Seal your lips tight around victim's mouth.
- Give 2 full breaths for 1 to 1-1/2 seconds each.



7 Check for Pulse at Side of Neck

- Feel for pulse for 5 to 10 seconds.



8 Phone EMS for Help

- Send someone to call an ambulance.

9 Begin Rescue Breathing

- Keep head tilted back.
- Lift chin.
- Pinch nose shut.
- Give 1 full breath every 5 seconds.
- Look, listen, and feel for breathing between breaths.



10 Recheck Pulse Every Minute

- Keep head tilted back.
- Feel for pulse for 5 to 10 seconds.
- If victim has pulse but is not breathing, continue rescue breathing. If no pulse, begin CPR.

For more information about these and other life-saving techniques, contact your Red Cross chapter for training.
"When Breathing Stops" reproduced with permission from an American Red Cross Poster.

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SPECIFICATIONS

Frequency:	1.6 MHz – 30 MHz.
Power Rating:	1 kW at 1.6 MHz to 30 MHz
Wind Rating:	150 mph
Operating Temperature:	–50° C to +65° C
Electrical Feed Point:	Bottom feed through tapped 1/4 inch – 20, female. Screw, terminal lug, and corona shield supplied.
Base Flashover Voltage:	25,000 volts

CONSTRUCTION

Antenna:	Fiberglass
Base Mounting Flange:	Reinforced fiberglass
Corona Ball:	Acrylic coated brass
Electrical Conductors:	Copper alloy
Center Fitting:	Silicon bronze material

DIMENSIONS

Maximum Flange Diameter:	12-1/2 inches
Mechanical Length, Overall:	36 feet nominal
Electrical Length:	36 feet
Fiberglass Diameter, Base:	6-1/2 inches
Fiberglass Diameter, Corona:	1-3/4 inches

WEIGHT

Net:	140 lbs.
Shipping:	205 lbs.

ABOUT THIS MANUAL

This manual contains information for the SB-V35S/HD Antenna. It is divided into three sections:

Section 1 General Information: introduction and description of the antenna.

Section 2 Installation: parts lists and a description of components.

Section 3 Maintenance: impedance and wind load charts.

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.

SECTION 1

GENERAL INFORMATION

1.1 INTRODUCTION

The SB-V35S/HD is a heavy-duty, 36-foot (11-m), two-section, fiberglass, whip antenna. It is designed for shipboard, fixed-station, and general-communications use. It is a bottom feed-thru antenna with a flange base which is bolted directly to a deck or platform. A separate porcelain insulator is not required.

It is designed for full-power use in the 1.6- to 30-MHz range with transmitters having up to 1 kW of power.

The SB-V35S/HD HF Whip Antenna has the Harris/RF Communications part number 100-5020.

1.2 ANTENNA COUPLERS

An antenna coupler (sometimes called an antenna tuner or antenna matching unit) is necessary for proper operation of the transmitter and to assure maximum effective radiated power (ERP) of the overall transmitting system.

Following is a list of Harris/RF Communications antenna couplers suitable for use with the SB-V35S/HD HF Whip Antenna:

- RF-2601 1-kW HF Fast-Tune Automatic Antenna Coupler
- RF-382 Fast-Tune Automatic Antenna Coupler
- RF-3281 Voice-Duty Automatic Digital Antenna Coupler
- RF-3282 Automatic Digital Antenna Coupler

SECTION 2

INSTALLATION

2.1 INTRODUCTION

The SB-V35S/HD HF Whip Antenna flange base is bolted directly to the deck of a ship or other suitable mounting platform.

2.2 SITE SELECTION

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.

2.3 ANTENNA COUPLER

Prior to beginning antenna installation, consult the instruction manual of the antenna coupler to be used with the SB-V35S/HD HF Whip Antenna for any special installation procedures or special considerations required by the antenna coupler.

2.4 ANTENNA INSTALLATION

WARNING

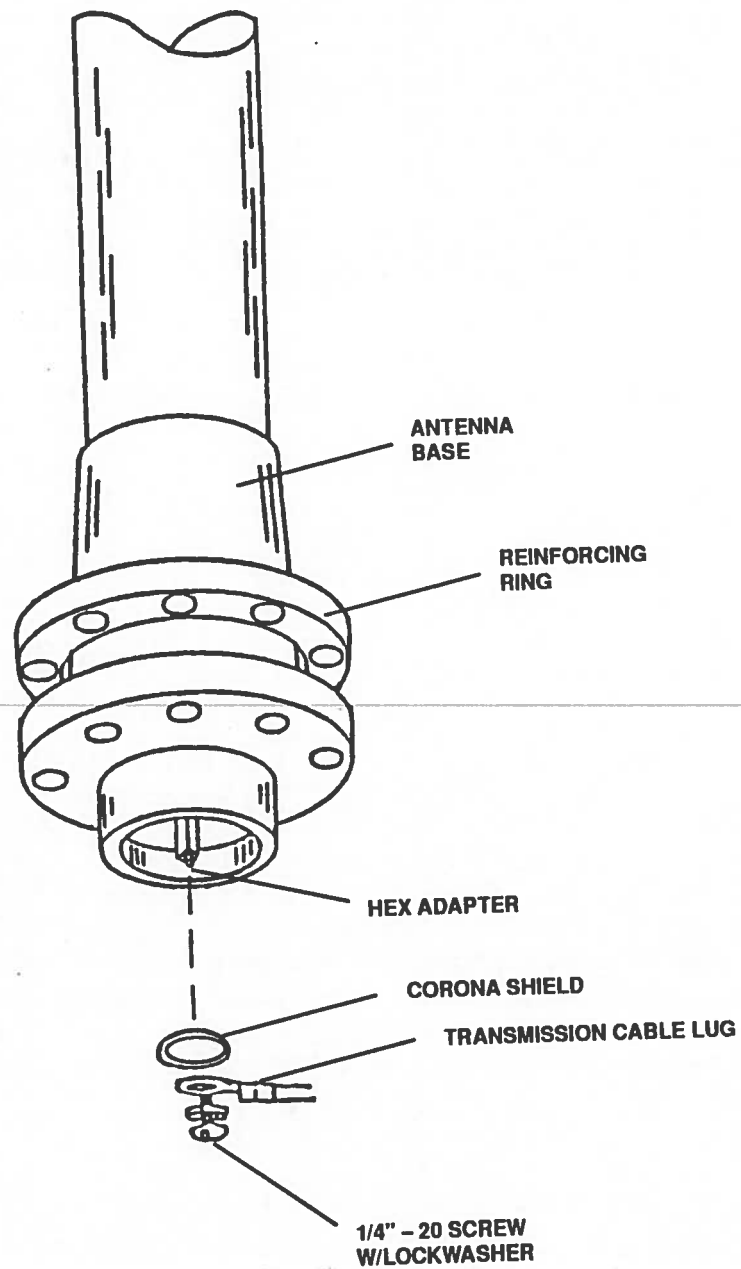
The installation of antennas and their associated support structures requires specialized skills. These installations should be made only by personnel experienced in these skills and only after they have thoroughly read and understood the supplied documentation. Failure to do so could result in injury 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.

Before beginning the antenna assembly, tighten the two conductor screws in the bottom of the top section at the center joint (see figure 2-3).

2.4.1 Assembly Procedure

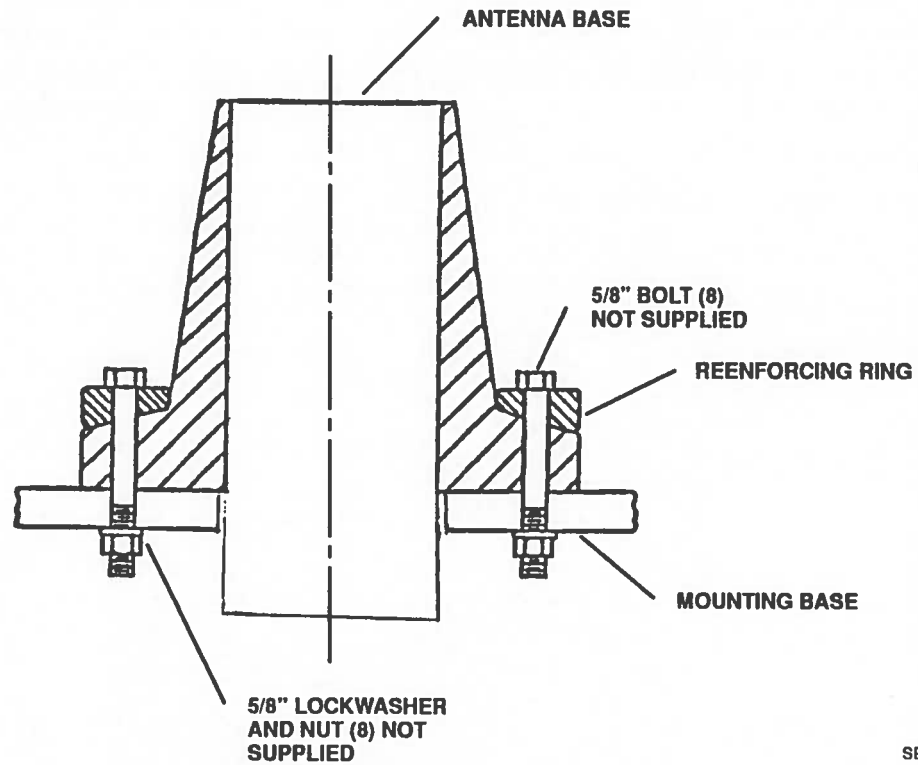
Use the following procedure to assemble the SB-V35S/HD HF Whip Antenna.

- a. Lay the two antenna mast sections horizontally on a flat surface.
- b. Slide the reinforcing ring down over the base section until it contacts the base flange. The beveled face of the reinforcing ring must face the base flange. (See figures 2-1 and 2-2.)
- c. Check to make sure the O-ring is positioned on top of the upper fitting on the base section. (See figure 2-3.)
- d. Make midsection connection by bolting the six 3/8-inch cap screws and lockwashers onto the base section, as shown in figure 2-3.



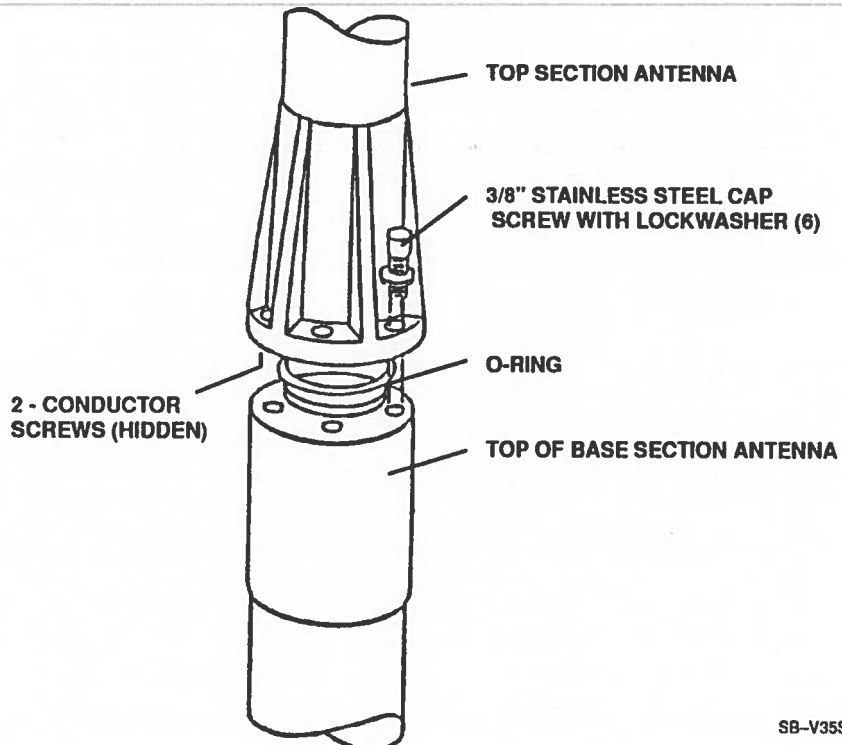
SB-V35S/HD-001

Figure 2-1. Base Section Detail



SB-V35S/HD-002

Figure 2-2. Mounting Bolt Detail



SB-V35S/HD-003

Figure 2-3. Midsection Detail

WARNING

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

- e. Drill eight 3/4-inch holes on a 10-3/4 inch diameter circle and one 6-1/2 inch diameter center hole onto surface where the base is to be mounted. Figure 2-4 provides the mounting and drilling instructions, as well as a template for mounting the antenna base. (Base section may be used as a template after the 6-1/4 inch center hole is cut.) Figure 2-5 is one-quarter portion of the actual mounting base template.
- f. Erect the antenna and fasten base securely using 5/8-inch bolts (not supplied). (See figure 2-2.)
- g. With the 1/4-inch screw and lockwasher, connect the transmission cable lug and corona shield to the hex adapter at the base of the antenna, as shown in figure 2-1.

CAUTION

Make all connections inside the corona shield provided (see figure 2-1) to prevent any sharp edges from touching or being in proximity to fiberglass surfaces. Sharp edges cause high-voltage and current stresses during transmitter operation which may cause burning of the fiberglass laminate to appear as black carbon. The 6-1/2 inch mounting hole must be free from any burrs or jagged edges. Make sure all edges near or touching the fiberglass surface are smooth.

- h. The installation is complete.

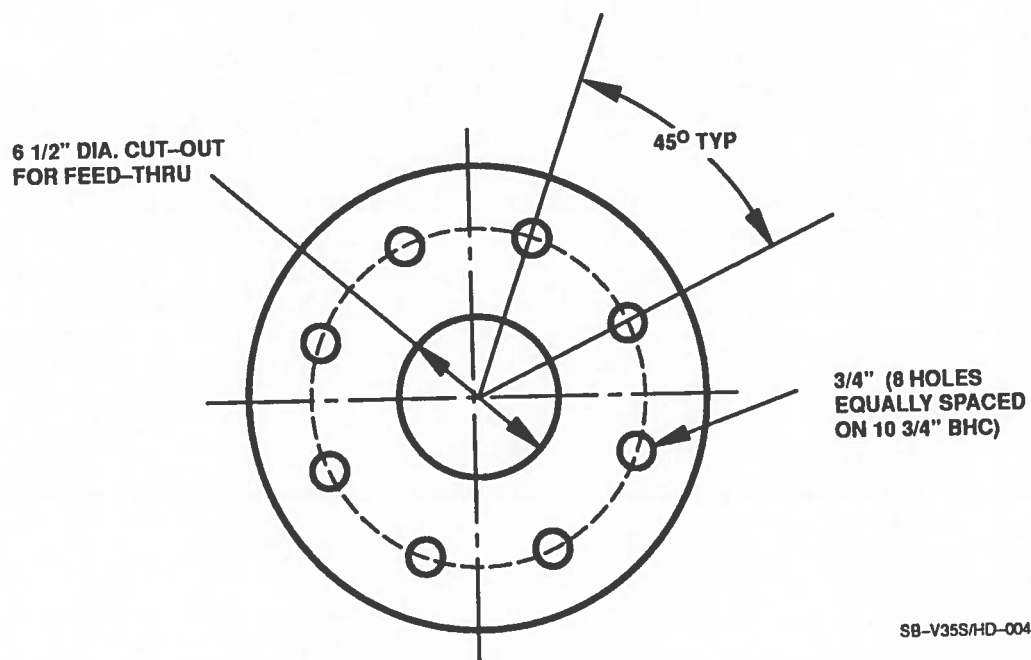


Figure 2-4. Mounting and Drilling Instructions

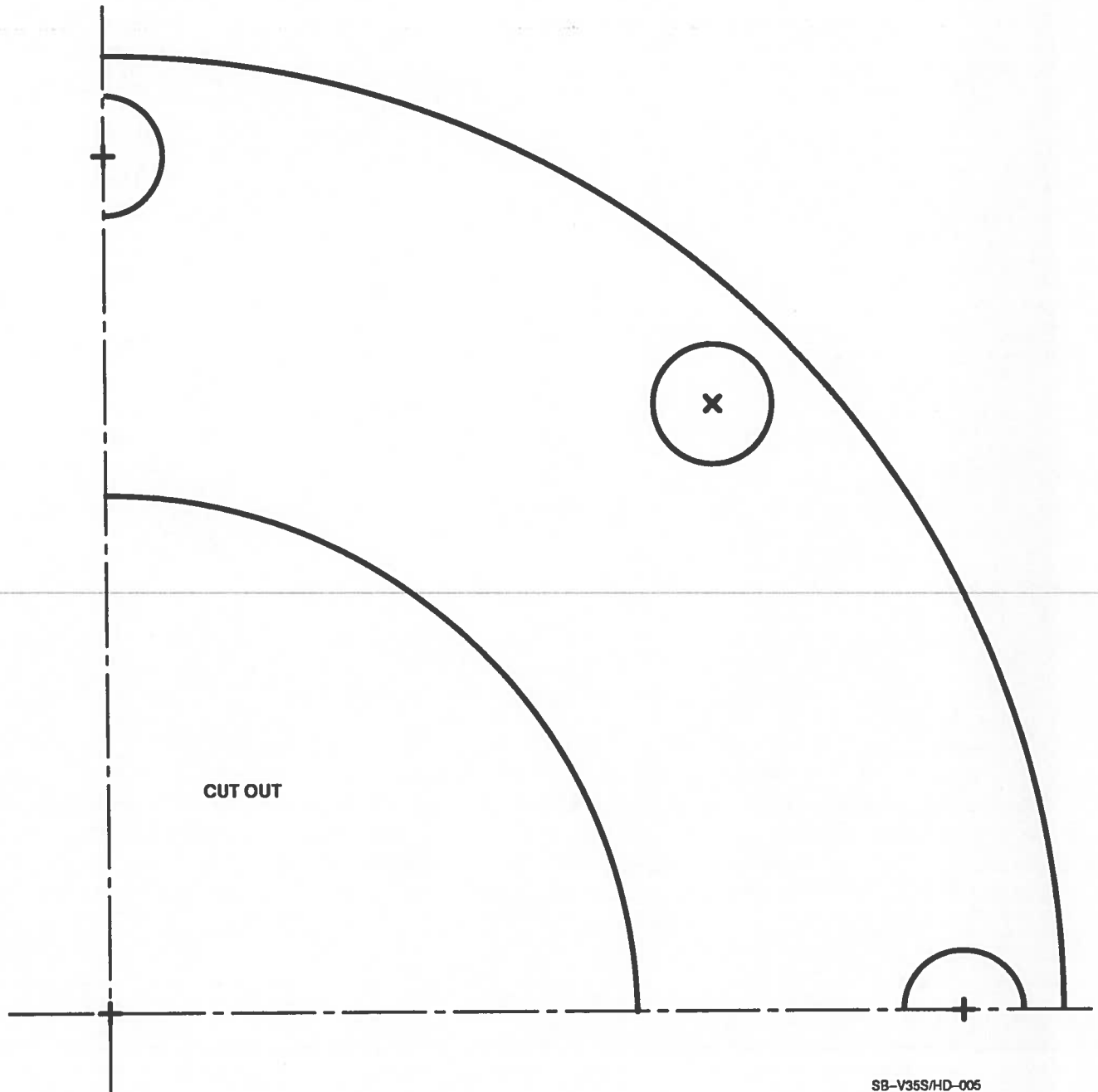


Figure 2-5. One-Quarter Full Size Mounting Template

SECTION 3

MAINTENANCE

3.1 ROUTINE INSPECTION, PREVENTIVE MAINTENANCE, AND OVERHAUL

Periodic routine inspections of the antenna are recommended to ensure long service life and reliable operation. Scheduling of such inspections is left to the discretion of the user. Some conditions that could cause eventual failure and that should be corrected when noted are listed in table 3-1.

Table 3-1. Routine Inspection/Preventive Maintenance/Corrective Action

Condition	Corrective Action
Corrosion (especially at electrical contact points), dust, dirt	Clean all corrosion from electrical contacts. Clean exterior surfaces with a mild soap and water solution.
Check the rf terminal lug connection	Verify connection tightness and cleanliness.
Worn or frayed insulation on coaxial cable	Repair or replace any damaged coaxial cable.
Loose hardware	Completely check all hardware on the antenna for tightness.

3.2 ANTENNA IMPEDANCE

Table 3-2 is an impedance chart for the SB-V35S/HD HF Whip Antenna. The impedances in this table were measured over a ground plane consisting of sixteen radials of random lengths between 100 feet and 144 feet long.

NOTE

When installing the SB-V35S/HD HF whip antenna in a fixed station application, a ground plane should be provided beneath the antenna.

For proper operation of the transmitter, an antenna tuner is required to match the antenna to $50+j0$ ohms. Consult Harris/RF Communications Marketing Department for assistance in selecting an appropriate antenna tuner.

Table 3-2. SB-V35S/HD HF Whip Antenna Impedance Chart

Frequency Megahertz	Resistance Ohms	Reactance Ohms
2.00	8.60	-600.00
4.00	18.50	-187.00
5.50	44.10	-9.10
5.6045	44.93	zero
6.00	57.20	+50.00
8.00	197.60	+293.80
9.50	713.30	+421.10
10.50	1065.00	+55.70

Table 3-2. SB-V35S/HD HF Whip Antenna Impedance Chart (Cont.)

Frequency Megahertz	Resistance Ohms	Reactance Ohms
11.00	1060.00	-324.60
12.00	497.00	-613.60
12.50	348.20	-582.40
13.00	240.30	-506.30
14.00	132.30	-368.70
15.00	77.80	-205.00
17.00	53.60	-129.40
19.00	95.70	-10.50
19.50	109.50	+5.13
22.00	370.50	+90.90
23.00	434.40	-100.00
24.00	398.40	-225.10
25.00	230.20	-224.80
26.00	146.70	-160.80
28.00	150.70	-92.90
30.00	228.80	-51.70

3.3 WIND LOAD DATA

Table 3-3 shows wind load data for the SB-V35S/HD HF Whip Antenna.

Table 3-3. Antenna Wind Load Data

Wind (MPH)	Tip Deflection In Inches	Moment at Base In Pounds
50	12	12,800
75	26	28,300
100	44	45,400
125	64	63,500
150	82	80,800

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