

## INSTRUCTION MANUAL

**ORDER NO. 337S**  
**MODEL V-4S**  
Collinear Gain Vertical  
for 420-450 MHz

PN 801910

### General Description

The new Hy-Gain V-4S 70 cm antenna is a collinear, dual  $\frac{1}{2}$  wave, omnidirectional, vertical antenna for the 420-450 MHz Amateur band. The V-4S features two sets of  $\frac{1}{4}$  wave radials which properly decouple the lower  $\frac{1}{2}$  wave radiator from the mast. It also features a 100 watt enclosed coil that matches the antenna to a normal 50 ohms. The feedpoint is a high quality "N" type connector that is protected from the weather within the lower radiator. The V-4S also features a mast-to-mast bracket that will accept up to a two inch O.D. mast.

The V-4S can also be used outside of the 70 cm Amateur band. Graphs are supplied so that the antenna can be set to any frequency between 420 and 470 MHz.

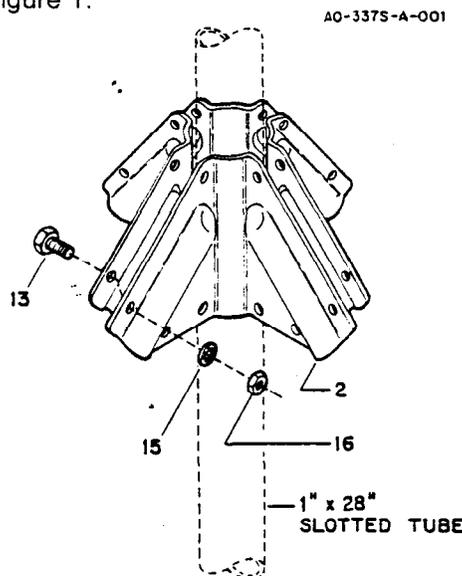
### Specifications

VSWR at resonance .....	less than 1.5:1
2:1 VSWR bandwidth .....	27 MHz minimum
Power gain .....	3 dBd, 5.2 dBi
Antenna/Mast isolation .....	20 dB
Power input .....	100 watts continuous
Lightning protection .....	DC ground
Height .....	45 inches (1.14 m)
Wind area .....	0.28 sq. ft. (0.026)
Maximum mast O.D. ....	2 inches (5.08 cm)
Hardware .....	18-8 stainless steel except for U-bolts

### Assembly

Unpack the antenna and check the parts against the Parts List and drawings.

Select four of the radial clamps and associated hardware and loosely assemble them as shown in figure 1.



Item No.	Description
2	Radial clamp, 45°
6	Tube, 1" x 28", slotted
13	Bolt, #10-24 x 1/2" hex
15	Lockwasher, #10, internal
16	Nut, #10-24, hex

Figure 1

Repeat the previous two steps for the remaining four radial clamps.

Set both assembled clamps upside down on a flat surface.

Select the eight radial tubes (7/16" x 6"), and insert them completely into the assembled radial clamps.

Tighten the outer eight screws of each assembly just enough to hold the radial tubes in place. These screws will be securely tightened in a later step.

Select the 1" x 28" tube.

Slip both radial assemblies over the bottom of the 28" tube and position as shown in Figure 3 and Detail A. The unslotted end of the 28" tube is the bottom. Determine the "B" dimension from figure 6. For example, at 445 MHz, B=8 3/16" (208 mm).

Tighten all screws in both radial assemblies securely and evenly.

Select the mast-to-mast clamp, plate and associated hardware and loosely assemble them as shown in Figure 2.

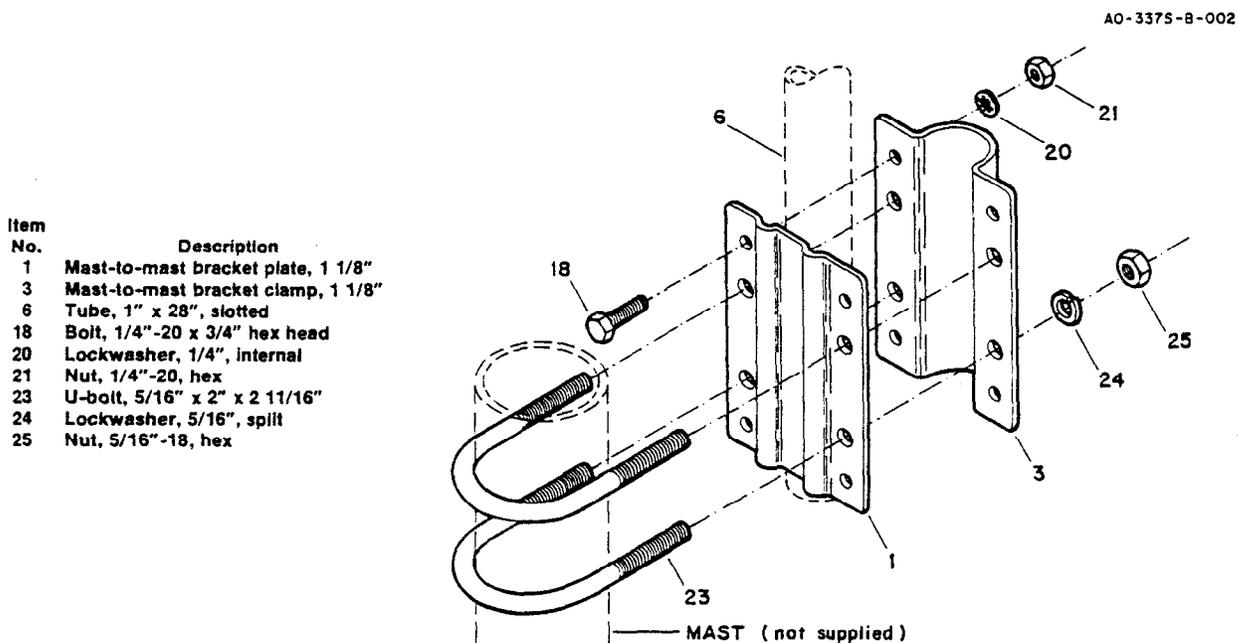


Figure 2

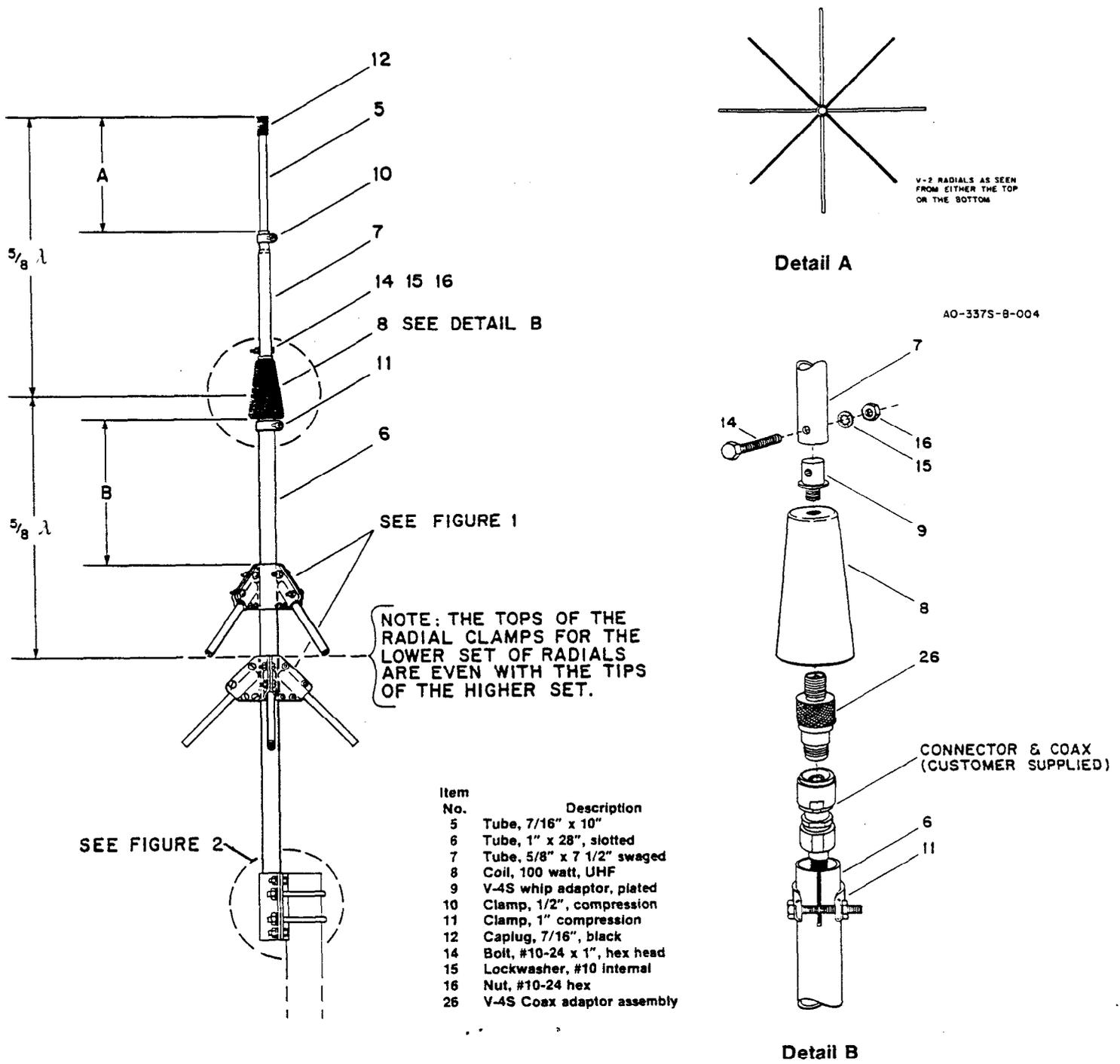
Slide the assembled clamp over the bottom end of the 28" tube as shown in Figure 3 and securely tighten the four 1/4"-20 x 3/4" screws.

Select the V-4S Coax adaptor assembly. The coaxial cable will attach to this in a later step. Select the matching coil.

Screw the adaptor assembly into the base of the matching coil until snug. The pin in the adaptor assembly should make contact with the pin in the base of the matching coil.

Select the V-4S whip adaptor. This part has 3/8"-24 thread on one end.

Screw the whip adaptor into the top of the matching coil.



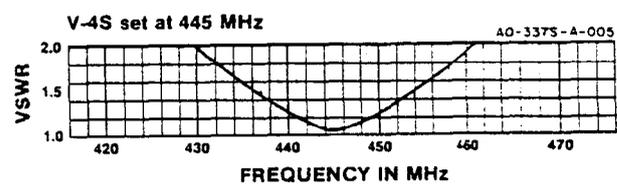
SEE DETAIL B

SEE FIGURE 1

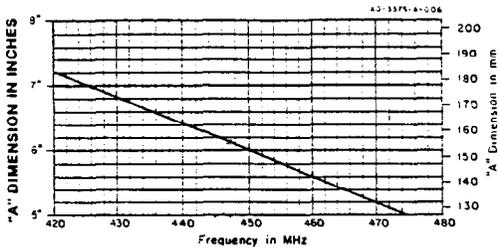
NOTE: THE TOPS OF THE RADIAL CLAMPS FOR THE LOWER SET OF RADIALS ARE EVEN WITH THE TIPS OF THE HIGHER SET.

SEE FIGURE 2

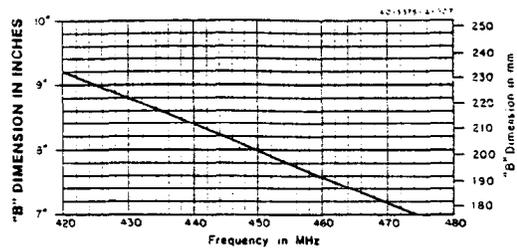
Item No.	Description
5	Tube, 7/16" x 10"
6	Tube, 1" x 28", slotted
7	Tube, 5/8" x 7 1/2" swaged
8	Coil, 100 watt, UHF
9	V-4S whip adaptor, plated
10	Clamp, 1/2", compression
11	Clamp, 1" compression
12	Caplug, 7/16", black
14	Bolt, #10-24 x 1", hex head
15	Lockwasher, #10 internal
16	Nut, #10-24 hex
26	V-4S Coax adaptor assembly



**Figure 4**



**Figure 5**

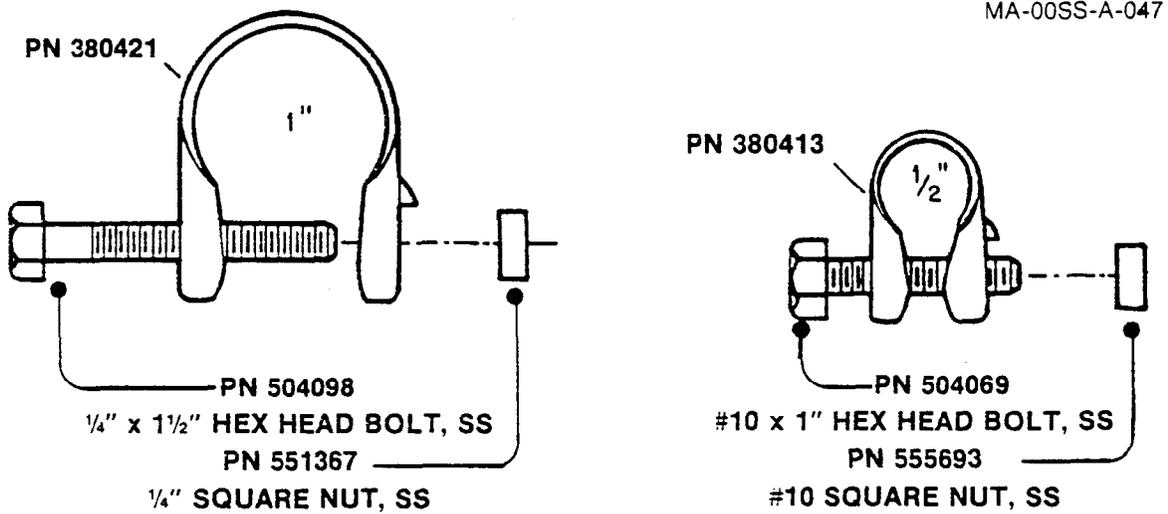


**Figure 6**

Select the 5/8" x 7 1/2" tube and slip the unswaged end over the whip adaptor.

Line up the holes in these two parts and secure using a #10-24 x 1" hex head screw, #10 internal lockwasher and #10-24 hex nut. Tighten securely.

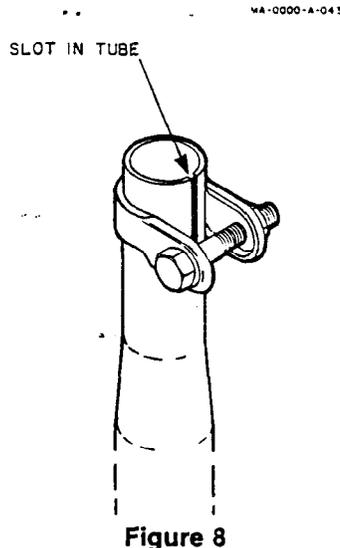
Assemble the two compression clamps as shown in Figure 7.



**Figure 7**

Slip the 1/2 inch compression clamp over the swaged end of the 5/8 x 7 1/2" tube as shown in Figure 8.

Select the 7/16" x 10" tube and insert it into the 5/8" tube, to Dimension "A". Refer to Figures 3 and 5. For example, at 445 MHz, A=6 3/16" (157 mm).



**Figure 8**

Tighten the compression clamp securely.

Select the 7/16" caplug and slip over the end of the 7/16" tube.

Select the assembled one inch compression clamp and slip it over the top end of the 1" x 28" tube. Position it as shown in Figure 8 and tighten it just enough to prevent it from sliding down the tube.

There are two ways to attach your coax to the V-4S antenna. The first method involves attaching a short length of coax to the antenna before attaching the antenna to the supporting mast. The remaining length of coax can then be attached and routed to the radio. The short length of coax must be at least 3 feet long so the connection between coax lengths can be made below the mast-to-mast bracket.

The second method involves attaching the complete length of coax to the antenna before attaching the antenna to the supporting mast. In this method, the antenna and entire coax length must be carried up the tower or mast.

Choose one of the suggested methods of attaching the coax to the V-4S.

Insert one end of the coax into the bottom of the 1" x 28" tube. Push the coax through until the connector emerges from the top of the tube.

Screw the connector onto the V-4S coax adaptor.

Push the coax adaptor into the top of the 1" x 28" tube until the matching coil rests on the one inch tube. Tighten the one inch compression clamp.

The antenna can now be mounted on a mast (2" O.D. max.). For adequate lightning protection, the antenna supporting structure must be well grounded.

***WARNING: Installation of this product near power lines is dangerous. For your safety, follow the installation directions.***

Several antennas may be mounted on the same mast. Your V-4S should be mounted above the other antenna for best performance. When side mounting the V-4S on a tower, it should be kept at least 10 inches away from the tower.

### Parts List

Item No.	Part No.	Description	Qty
1	160011	Mast-to-mast bracket plate, 1 1/8" .....	1
2	160012	Radial clamp, 45° .....	8
3	160047	Mast-to-mast bracket clamp, 1 1/8" .....	1
4	170474	Tube, 7/16" O.D. x 6" .....	8
5	170475	Tube, 7/16" x 10" .....	1
6	191003	Tube, 1" O.D. x 28" Slotted .....	1
7	191004	Tube, 5/8" x 7 1/2" swaged, drilled & slotted .....	1
8	872202	Coil, 100 watt, UHF .....	1
	872203	Parts Pack, (stainless steel) V-4S .....	1
9	280168	V-4S whip adaptor, plated .....	1
10	380413	Clamp, 1/2", compression .....	1
11	380421	Clamp, 1", compression .....	1
12	455644	Caplug, 7/16", black .....	1
13	500158	Bolt, #10-24 x 1/2", hex head .....	33
14	504069	Bolt, #10-24 x 1", hex head .....	2
15	565697	Lockwasher, #10, internal .....	33
16	554071	Nut, #10-24, hex .....	33
17	555693	Nut, #10-24, square .....	1
18	505266	Bolt, 1/4"-20 x 3/4", hex head .....	4
19	504098	Bolt, 1/4"-20 x 1 1/2", hex head .....	1
20	562961	Lockwasher, 1/4", internal .....	5
21	554099	Nut, 1/4"-20, hex .....	4
22	551367	Nut, 1/4"-20, square .....	1
23	540036	U-bolt, 5/16" .....	2
24	564792	Lockwasher, 5/16", split .....	4
25	555747	Nut, 5/16"-18, hex .....	4
26	872205	V-4S coax adaptor assembly .....	1

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