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V-2R  
 VHF Collinear Gain Vertical  
 for 144-148 MHz

# INSTRUCTION MANUAL

## GENERAL DESCRIPTION

The new Hy-Gain V-2R, two meter antenna is a collinear 5/8-wave omnidirectional vertical antenna for the 144-148 MHz Amateur band. The V-2R features two sets of 1/4-wave radials which properly decouple the lower 5/8-wave radiator from the mast. It also features a 500 watt enclosed coil that matches the antenna to a nominal 50 ohms. The ruggedized V-2R is suitable for personal use, repeater, and packet BBS service.

The feedpoint is a standard UHF connector that is protected from the weather within the lower radiator. The V-2R also features a mast-to-mast bracket that will accept up to a two inch O.D. mast.

The V-2R can also be used outside of the two meter Amateur band. Graphs are supplied so that the antenna can be set to any frequency between 138 and 174 MHz.

## SPECIFICATIONS

VSWR at Resonance .....	less than 1.5:1
2:1 VSWR Band Width .....	10 MHz minimum
Power Gain .....	3 dBd (5.2 dBi)
Antenna/Mast Isolation .....	20 dB
Power Input .....	500 watts continuous
Lightning Protection .....	DC ground
Height (nominal) .....	108 inches (2743 mm)
Wind Area .....	0.67 sq. ft. (.062 sq. m)
Maximum Mast O.D. ....	2 inches (51 mm)
Hardware .....	18-8 stainless steel except for U-bolts
Maximum Wind Survival (without ice) .....	105 mph (168.98 kmph)
Net Weight .....	6.3 lbs (2.86 kg)

## ASSEMBLY

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

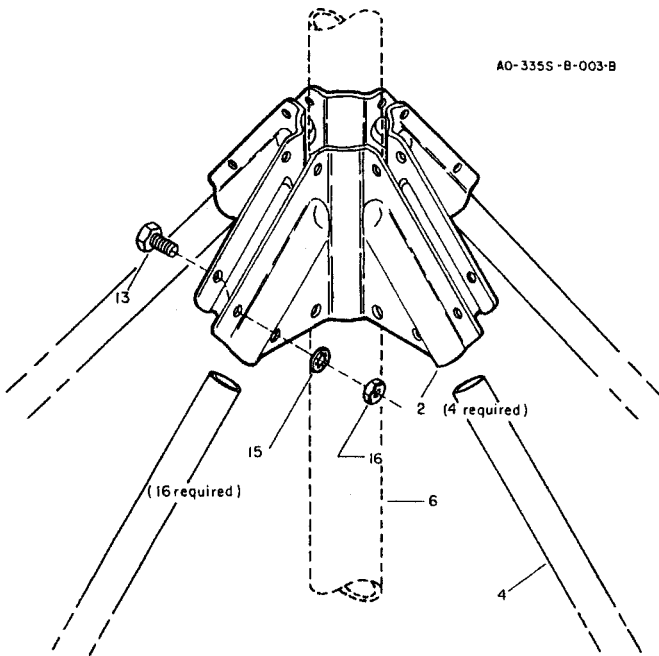
Select four of the radial clamps and associated hardware and loosely assemble them as shown in Figure 1.

Repeat the previous step for the remaining four radial clamps.

Set both assembled clamps upside down on a flat surface.

Select the eight (8) 7/16" x 17 1/8" radial tubes (Item No. 4), and insert them completely into the assembled radial clamps.

Tighten the outer eight (8) screws of each assembly just enough to hold the radial tubes in place. These screws will be securely tightened in a later step.



Item No.	Description
2	Radial Clamp, 45 degrees
4	Tube 7/16" x 17 1/8"
6	Tube, 1" O.D. x 60", slotted
13	Bolt, #10-24 x 1/2", hex head
15	Lockwasher, #10, internal
16	Nut, #10-24, hex

Figure 1 Radial Clamp Assembly

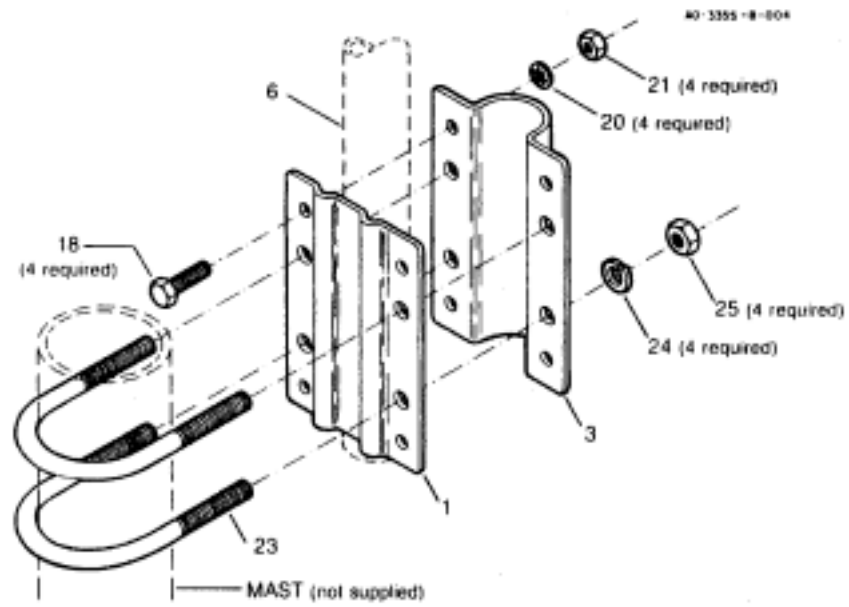
Select the 1" x 60" tube (Item No. 6).

Slip both radial assemblies over the bottom of the 60" tube and position as shown in Figure 4 and Detail A. The unslotted end of the 60" tube is the bottom. Determine the "B" dimension from Figure 7. For example, at 146 MHz, B = 32 3/8" (822 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.

Slide the assembled mast-to-mast clamp over the bottom end of the 60" tube as shown in Figure 2 and securely tighten the four (4) 1/4"-20 x 3/4" bolts, nuts and lockwashers (Item Nos. 18, 20 & 21).



Item No.	Description
1	Mast-to-Mast Bracket Plate, 1 1/8"
3	Mast-to-Mast Bracket Clamp, 1 1/8"
6	Tube, 1" O.D. x 60", slotted
18	Bolt, 1/4"-20 x 3/4", hex head
20	Lockwasher, 1/4", internal
21	Nut, 1/4"-20, hex
23	U-bolt, 5/16" x 2" x 2 11/16"
24	Lockwasher, 5/16", split
25	Nut, 5/16"-18, hex

**NOTE:** The end of the 1" x 60" tube (Item 6) should be even with the bottom of the mast-to-mast brackets (Item 1 and 3).

Figure 2 Mast-to-Mast Clamp

UPPER RADIATOR/COIL  
ASSEMBLY Refer to Figure 3.

Select the V-2R VHF Coil assembly. The coaxial cable will attach to this in a later step.

Select one No. 10 compression clamp (Item 11) and install over the slotted tube end of the coil assembly (Item 8).

Select the 7/8" O.D. x 24" tube (Item 7) and insert the plain end into the slotted tube of the coil assembly approximately 2". Position the compression clamp as shown in Figure 5 and tighten securely.

Select one No. 6 compression clamp (Item 10) and place over the swaged/slotted end of the 7/8" tube (Item 7).

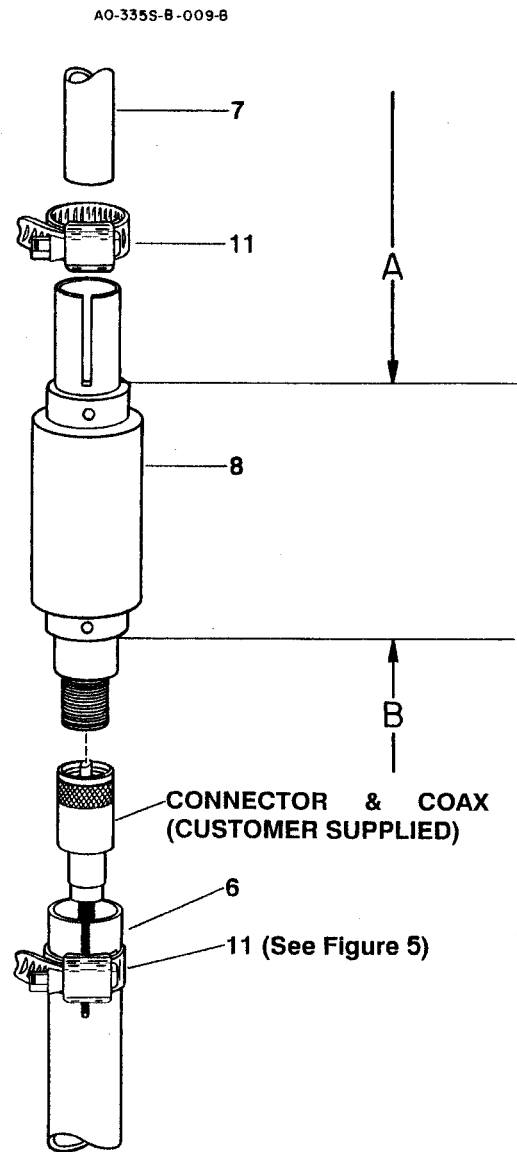
Select the 5/8" x 31" (Item 5) tube and insert either end into the 7/8" tube (Item 7).

Refer to Figure 4. Adjust the 5/8" x 31" tube so dimension "A" is equal to 41 1/2" for two meter operation. Tighten the No. 6 compression clamp (Item 6) securely.

NOTE: The tuning charts in this manual are accurate. However, due to variation in installations some minor adjustments may be required to resonate the antenna on the desired frequency.

Select the 5/8" caplug (Item No. 12) and slip it over the end of the 5/8" tube.

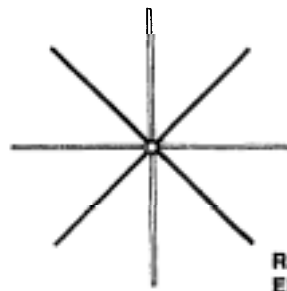
NOTE: Dimension "A" is from the top of the coil form to the tip of the element. Dimension "B" is from the bottom of the plastic coil form to the top of the radial clamps.



Item No.	Description
6	Tube, 1" O.D. x 60", slotted
7	Tube, 7/8" x 24" swaged & slotted
8	Coil, 500 watt, VHF
10	Clamp, #6, Tubing
11	Clamp, #10, Tubing

Figure 3 Upper Radiator/Coil  
Assembly

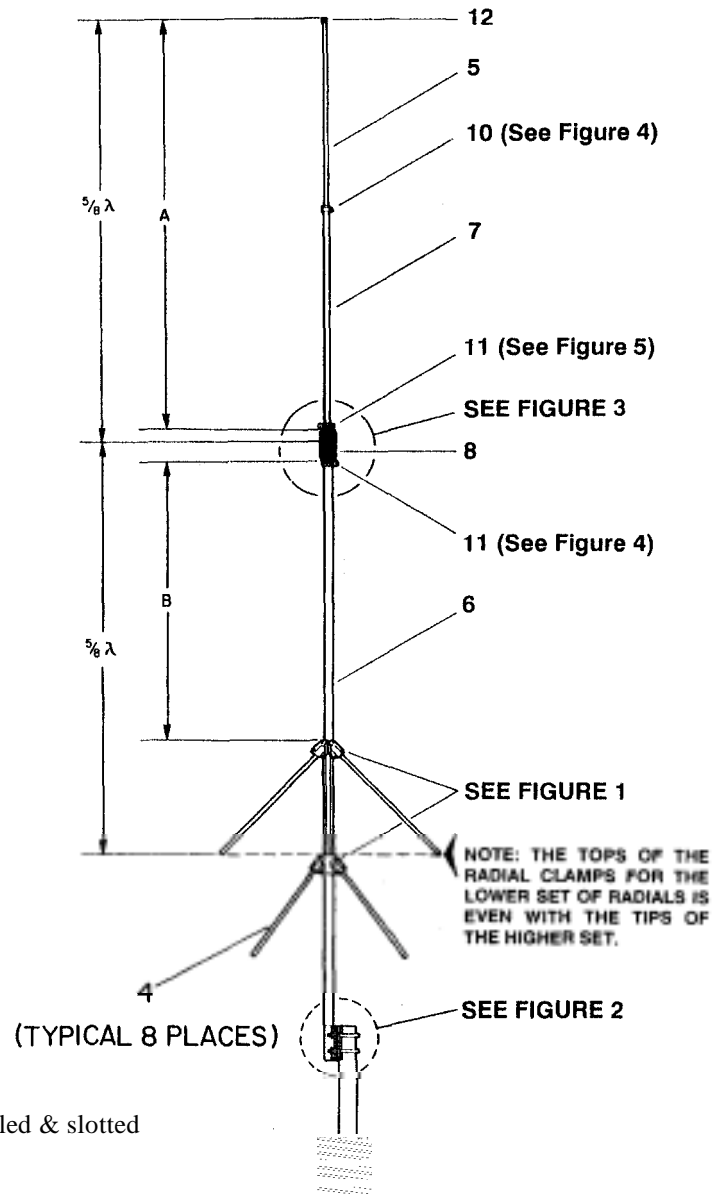
**NOTE:** At 146 MHz, A = 41 1/2" (1054 mm), B = 32 3/8" (822 mm).



**RADIALS AS SEEN FROM EITHER THE TOP OR THE BOTTOM.**

**Detail A  
Top or Bottom View of Radials**

AO-335S-B-005-B



Item

- |     |   |
|-----|---|
| No. | Description                                 |
| 6   | Tube, 1" O.D. x 60", slotted                |
| 7   | Tube, 7/8" x 24", swaged, drilled & slotted |
| 8   | Coil, 500 watt, VHF                         |
| 10  | Clamp, N6, Tubing                           |
| 11  | Clamp, #10, Tubing                          |
| 12  | Caplug, 5/8", black                         |

**Figure 4  
Overall  
View**

Select the proper size tube clamp as shown in Figure 5. When installing the clamps, place the clamp near the tube end with the top of the clamp over the slot in the tube as shown.

After adjustment of the tubing lengths, tighten the clamp with a 5/16 inch nut driver, socket, or open end wrench until the tubing will not twist or telescope.

**Figure 5**  
**Compression Clamps**

The remaining length of coax can then be attached and routed to the radio. The short length of coax must be at least 6 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.

Figure 6 Dimension  
"A" Chart

Choose one of the suggested methods of attaching the coax to the V-2R.

Insert one end of the coax into the bottom of the 1" x 60" tube. Push the coax through until the connector emerges from the top of the tube.

Screw the coax connector onto the V-2R coil connector.

Push the coax cable into the top of the 1" x 60" 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.

Figure 7 Dimension  
"B" Chart

#### WARNING

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

Select the No. 10 tube clamp and slip it over the top end of the 1" x 60" tube. Position it as shown in Figure 3 and tighten it just enough to prevent it from sliding down the tube.

## INSTALLATION

There are two ways to attach your coax to the V2R antenna. The first method involves attaching a short length of coax to the antenna before attaching the antenna to the supporting mast.

Several antennas may be mounted on the same mast. Your V-2R should be mounted above the other antenna for best performance. When side mounting the V-2R on a tower, it should be kept at least 20 inches away from the tower.

# ANNOUNCING

Hy-Gain now makes a similar antenna for 400470 MHz called the V-4R. Inquire at your local Hy-Gain dealer for more information.

## PARTS LIST

Item No.	Part No.	Description	Qty
1	160011	Mast-to-Mast bracket plate, 1 1/8" .....	1
2	160012	Radial clamp, 45 degrees .....	8
3	160047	Mast-to-mast bracket clamp, 1 1/8" .....	1
4	170445	Tube, 7/16" O.D. x 17 1/8" .....	8
5	170614	Tube, 5/8" O.D. x 31" .....	1
6	191001	Tube, 1" O.D. x 60", slotted .....	1
7	190204	Tube, 7/8" x 24", swaged & slotted .....	1
8	878630	Coil, 500 watt, VHF .....	1
	878631	Parts Pack, 3355-1, Stainless Steel .....	1
9		(Not Used)	
10	358756	Clamp, #6 tube .....	1
11	358757	Clamp, #10 tube .....	2
12	450503	Caplug, 5/8", black .....	1
13	500158	Bolt, #10-24 x 1/2", hex head .....	32
14		(Not Used)	
15	565697	Lockwasher, #10, internal .....	32
16	554071	Nut, #10-24, hex .....	32
18	505266	Bolt, 1/4"-20 x 3/4", hex head .....	4
20	562961	Lockwasher, 1/4", internal .....	4
21	554099	Nut, 1/4"-20, hex .....	4
23	540036	U-bolt, 5/16" x 2" x 2 11/16" .....	1
24	564792	Lockwasher, 5/16", split .....	4
25	555747	Nut, 5/16"-18, hex .....	4

NOTE: Some extra small parts are included but not used.