hy-gain®

ORDER NO. V-4PRO

MODEL V4-PRO
Collinear Gain Vertical
for 400-470 MHz

INSTRUCTION MANUAL

General Description

The new Hy-Gain V4-PRO antenna is a collinear, dual 5/8-wave, omnidirectional, vertical antenna for the 400-470 MHz frequency band. The V4-PRO 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 feedpoint is a high quality "N" type connector that is protected from the weather within the lower radiator. The V4-PRO also features a mast-to-mast bracket that will accept up to a 2 1/4" O.D. mast.

Graphs are supplied so that the antenna can be set to any frequency between 400 and 470 MHz.

SPECIFICATIONS

VSWR at Resonance	less than 1.5:1 2:1
VSWR Band Width	27 MHz minimum
Power Gain	3 dBd (5.2 dBi)
Antenna/Mast Isolation	20 dB
Power Input	500 watts
Lightning Protection	DC ground
Height (nominal)	46 inches (1.17 m)
Wind Area	0.31 sq. ft. (0.03 sq.m)
Maximum Mast O.D.	2 1/4 inches (57 mm)
Hardware	18-8 stainless steel
Maximum Wind Survival (no ice)	230 mph (370 kmph)
Net Weight	7 lbs

Assembly

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

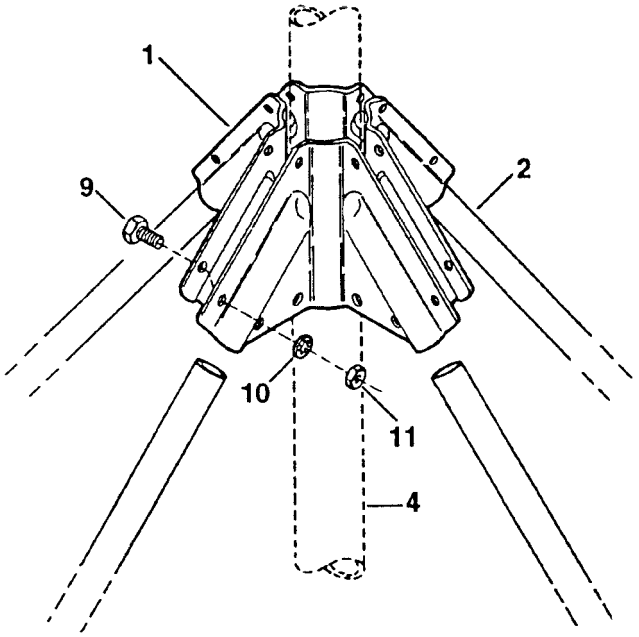
Select four of the radial clamps and associated hardware and loosely assemble them as shown in Figure 1.

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 6" radial tubes (Item No. 2), and insert them completely into the assembled radial clamps.

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



Item No.	Description
1	Radial Clamp, 45 degrees
2	Tube, 7/16" O.D. x 6"
4	Tube, 1" O.D. x 28", slotted
9	Bolt, #10-24 x 1/2", hex head
10	Lockwasher, #10, internal
11	Nut, #10-24, hex

Figure 1 Radial Clamp Assembly

Select the 1" x 28" tube (Item No. 6).

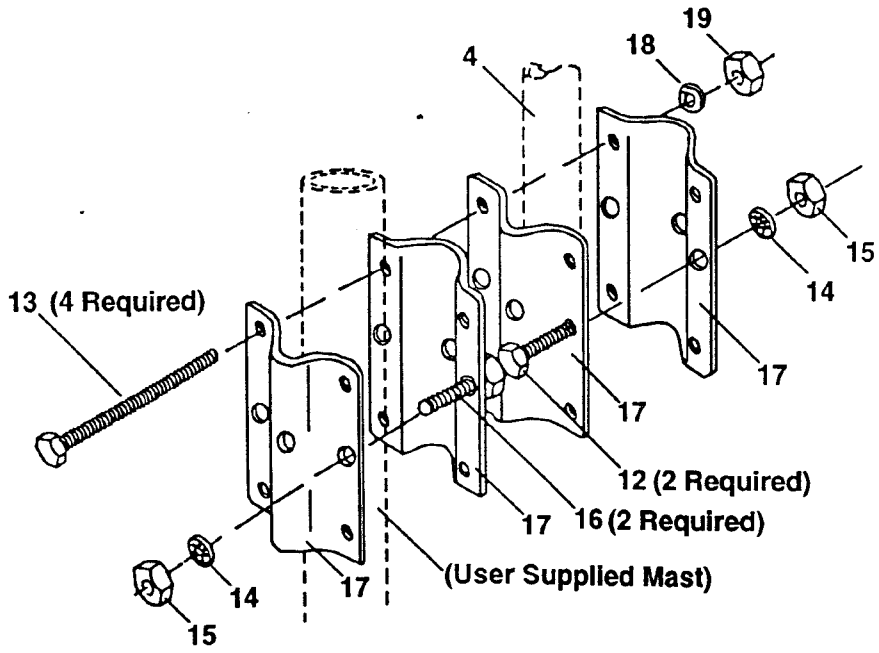
Slip both radial assemblies over the bottom of the 28 inch tube and position as shown in Figure 3. The unslotted end of the 28 inch tube is the bottom. Determine the "B" dimension from Figure 6. For example, at 445 MHz, B = 6 3/8" (162 mm). Determine the "C" dimension from Figure 7. At 445 MHz, C = 2 1/4" (57 mm). Tighten all bolts in both radial assemblies securely and evenly.

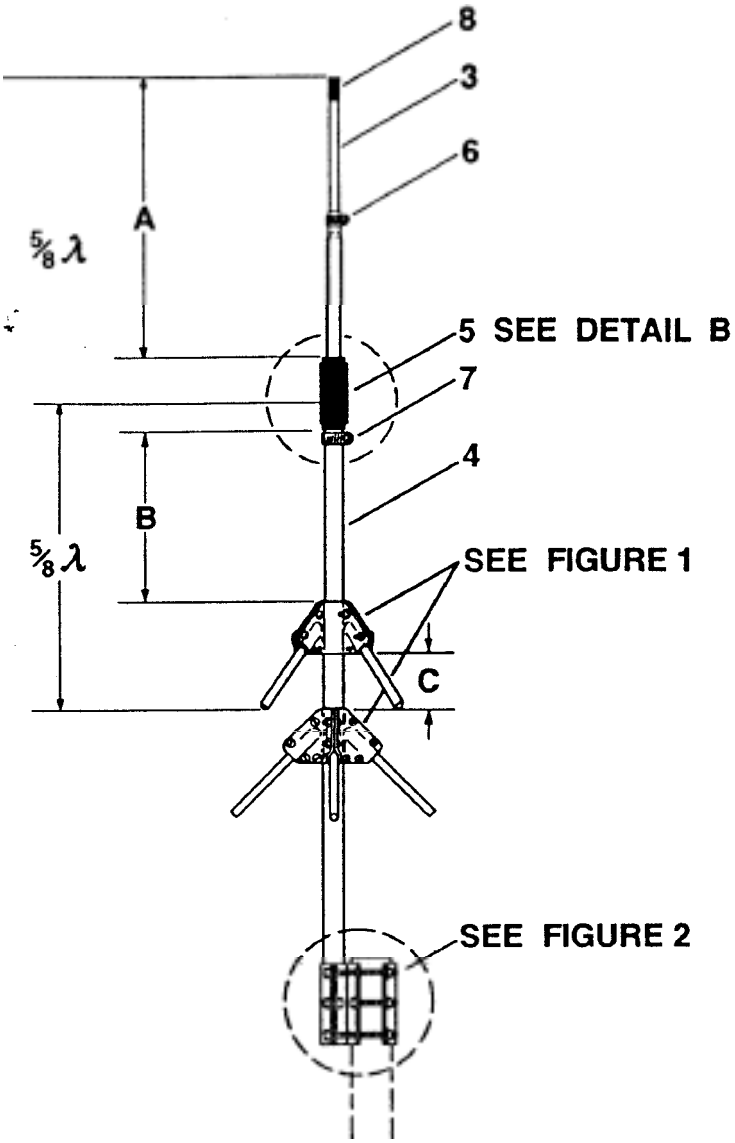
Select the mast-to-mast clamp, plate, and associated hardware and loosely assemble them as shown in Figure 2.

Slide the assembled mast-to-mast clamp over the bottom end of the 28" tube as shown in Figure 2 and securely tighten the two (2) 1/4"-20 x 1" bolts, nuts and lockwashers (Item No.s 12, 14, & 15).

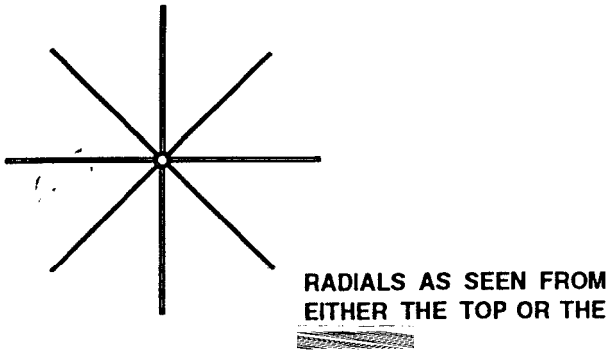
NOTE: The end of the 1" x 28" tube (Item 6) should be even with the bottom of the mast-to-mast clamps (Item 17)

Item No.	Description
4	Tube, 1" O.D. x 28", slotted
12	Bolt, 1/4"-20 x 1", hex head
13	Bolt, 5/16"-18 x 5", hex head
14	Lockwasher, 1/4", internal
15	Nut, 1/4"-20, hex
16	Bolt, 1/4"-20 x 2", hex head
17	Mast-to-Mast Clamp
18	Lockwasher, 5/16", split
19	Nut, 5/16"-18, hex

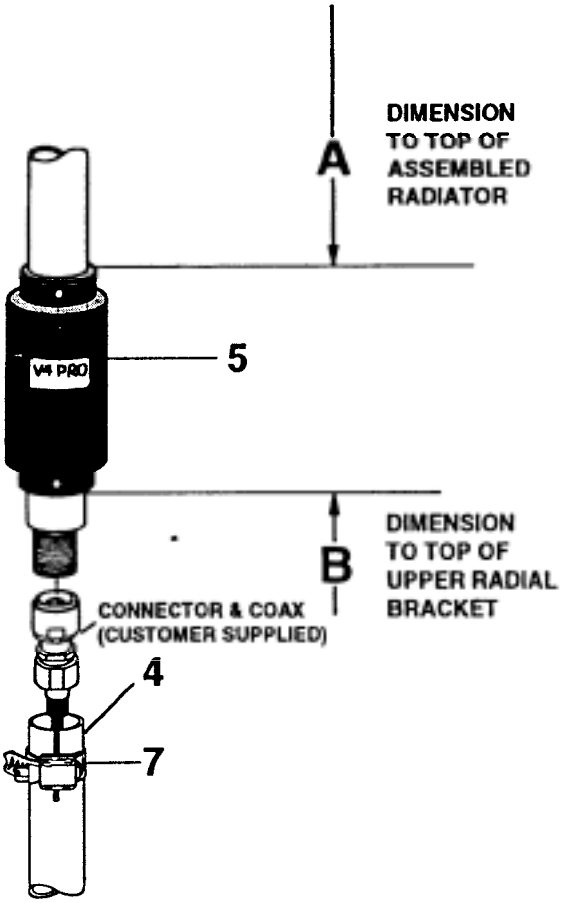




Item No.	Description
3	Tube, 5/8" x 9 1/2"
4	Tube, 1" O.D. x 28", slotted
5	Coil, 500 watt, UHF
6	Clamp, #6 tubing
7	Clamp, #10 tubing
8	Caplug, 5/8", black



Detail A Top or Bottom View of Radials



Detail B Connecting Coax to Coil

Figure 3 Overall View

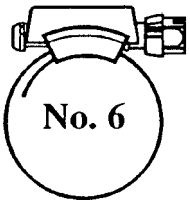
Select the No. 6 clamp (Item 10) and slide over the swaged end of the 7/8" tubing attached to the coil assembly. Insert the 5/8" x 9 1/2" tube into the 7/8" tube.

Adjust dimension "A" to the desired setting per plastic

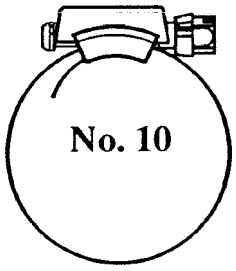
the graph in Figure 5. For example, at 445 MHz, A form. = 12 1/2" (318 mm). Tighten the tubing clamp securely, until the tubing will not twist or telescope.

Check all measurements for accuracy prior to the installation of your antenna. Refer to the tuning charts for additional resonant frequency settings.

NOTE: Dimensions are to the edges of the coil



Part No.	Description	Fits Tubing Sizes
358756	Clamp, Size #6 all stainless steel 5/16" hex head screw	- 1/2 And 3/4"



Part No.	Description	Fits Tubing Sizes
358757	Clamp, Size #10 " all stainless steel 5/16 hex head screw	1

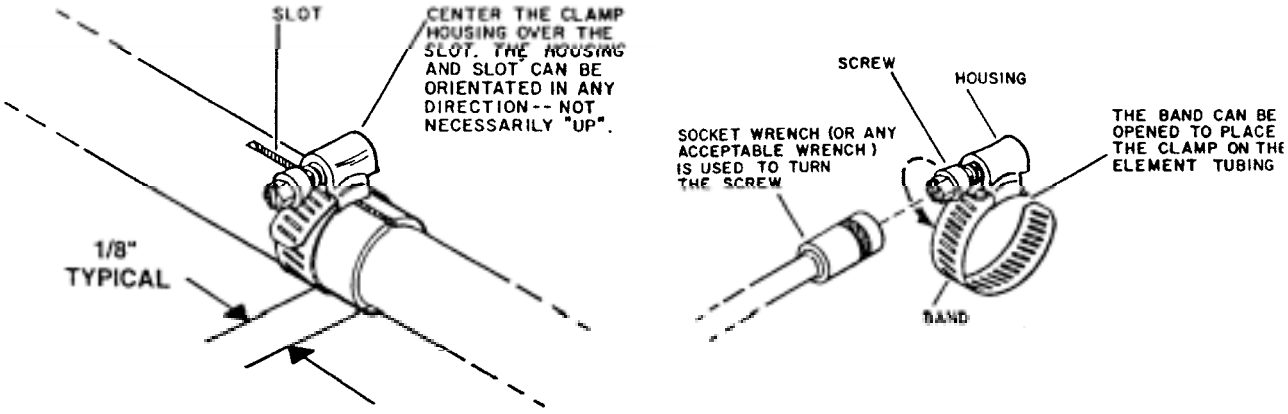


Figure 4 Compression Clamps

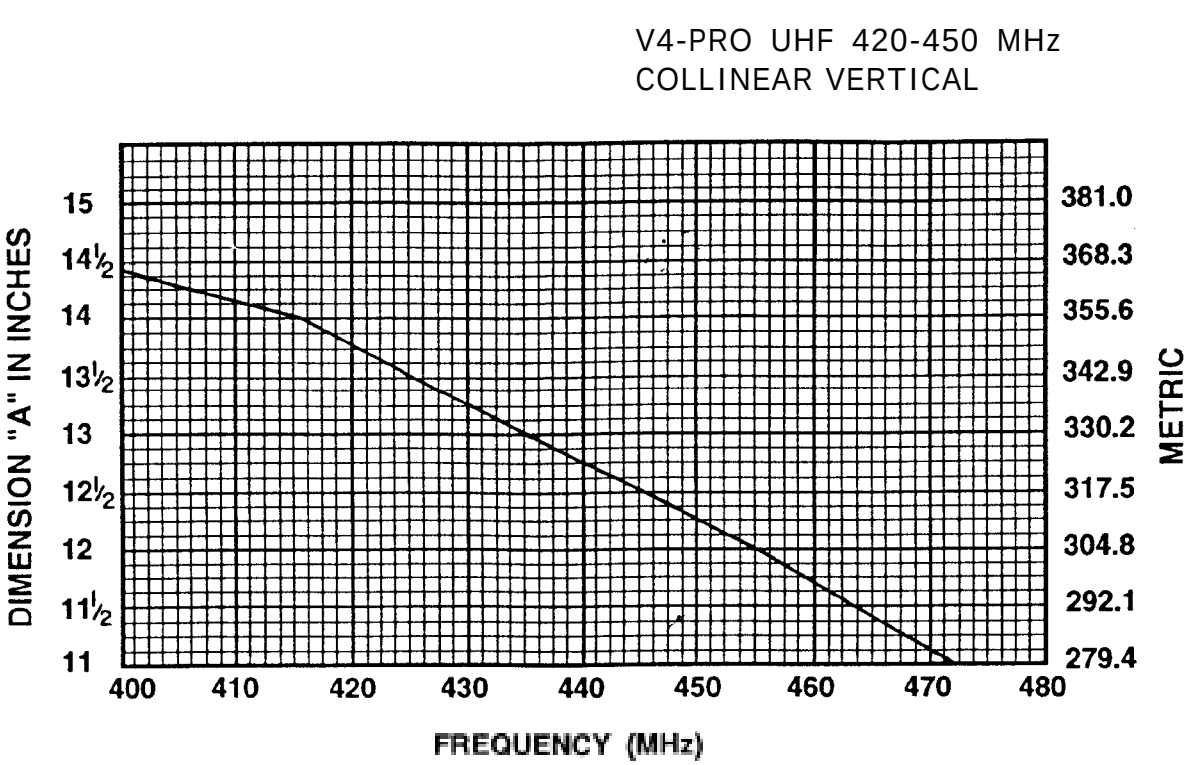


Figure 5 Dimension
"A" Chart

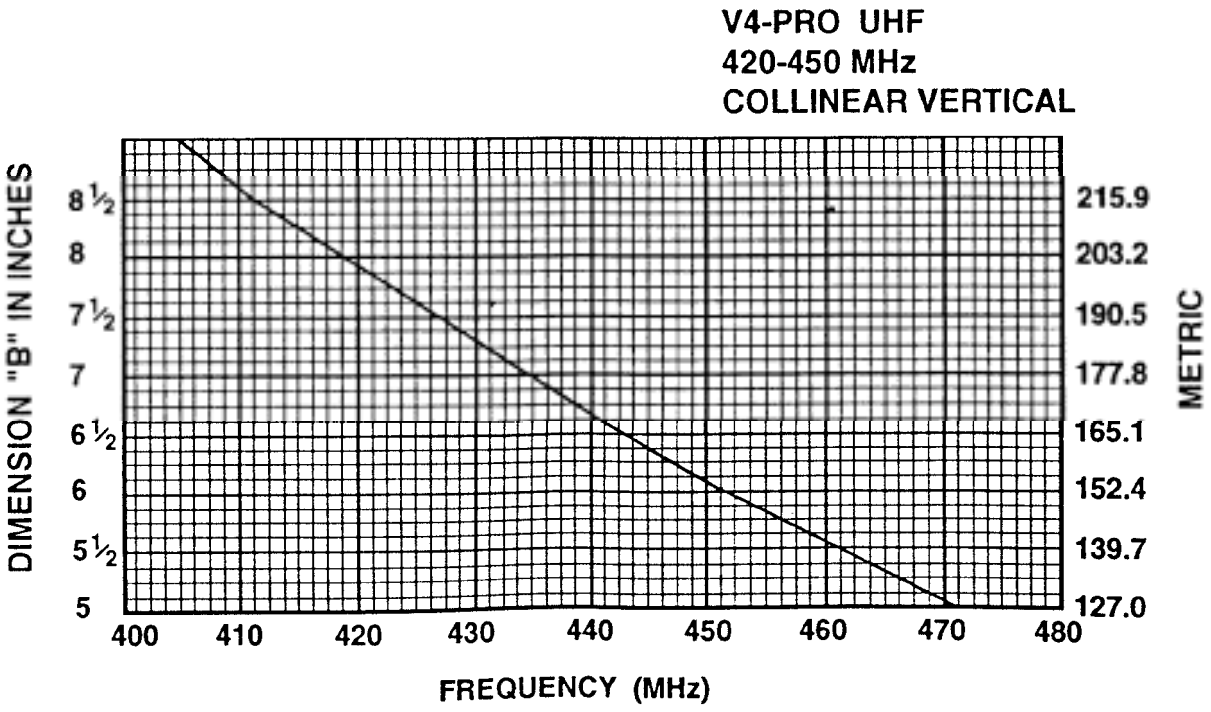


Figure 6 Dimension
"B" Chart

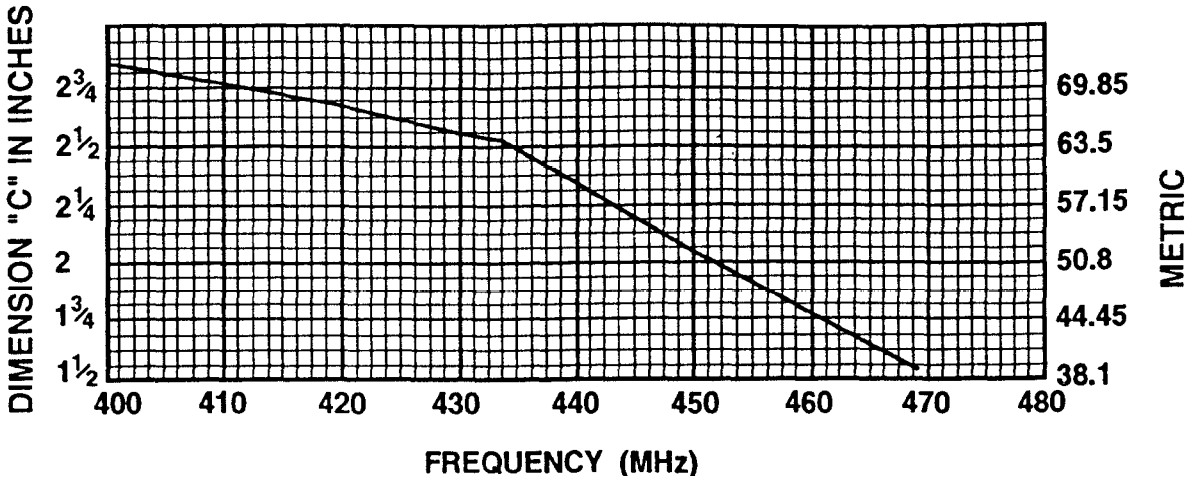


Figure 7 Dimension
"C" Chart

Tighten the tube clamp

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

Select the No. 10 tube clamp and slip it over the top end of the 1" x 28" tube. Position it as shown in Figure 4 and tighten it just enough to prevent it from sliding down the tube.

Installation

There are two ways to attach your coax to the V4-PRO 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 three feet (3') 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 V4-PRO.

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 V4-PRO coil assembly.

Push the coil assembly 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 securely.

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 V4-PRO should be mounted above the other antenna for best performance. When side mounting the V4-PRO on a tower, it should be kept at least 10 inches away from the tower.

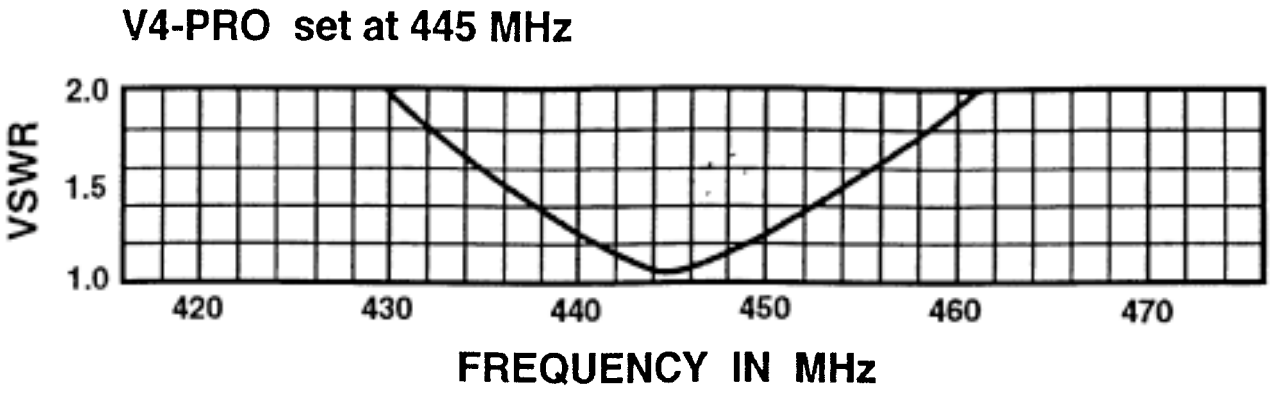


Figure 8
VSWR Chart

PARTS LIST

Item No.	Part No.	Description Qty
1	160012	Radial clamp, 45 degrees 8
2	170474	Tube, 7/16" O.D.x 6" 8
3	179803	Tube, 5/8" x 9 1/2" 1
4	878705	Tube, 1" O.D. x 28", reinforced 1
5	878704	Coil, 500 watt, UHF.....1
	878700	Parts Pack, V4-PRO clamps 1
6	358756	Clamp, #6 tube.....1
7	358757	Clamp, #10 tube.....2
8	450503	Caplug, 5/8", black.....1
9	500158	Bolt, #10-24 x 1/2", hex head 33
10	565697	Lockwasher, #10, internal 33
11	554071	Nut, #10-24, hex 33
	878701	Parts Pack, V4-PRO Base
12	502958	Bolt, 1/4"-20 x 1", hex head 2
13	500387	Bolt, 5/16"-18 x 5, hex head 4
14	562961	Lockwasher, 1/4", internal .....„4
15	554099	Nut, 1/4"-20, hex.....4
16	505737	Bolt, 1/4"-20 x 2", hex head 2
17	5137000-1	Mast clamp.....4
18	564792	Lockwasher, 5/16", split..... 4
19	555747	Nut, 5/16"-18, hex.....4

NOTE: Some extra parts are included to replace lost parts during assembly.