



ORDER NO.
385

INSTALLATION & OPERATION INSTRUCTIONS

**14 AVQ, 10-THRU-40 METER
VERTICAL TRAPPED ANTENNA**

HY-GAIN ELECTRONICS CORPORATION
Rural Route 3 Lincoln, Nebraska 68505

GENERAL DESCRIPTION:

The Hy-Gain Model 14 AVQ is an omni-directional, self supporting vertical radiator designed to operate on 10 through 40 meters. 80 meter operation may be added by simply attaching a base loading coil (Hy-Gain Model LC-80Q) available at your local Hy-Gain dealer. The antenna system is designed to work against earth ground or a radial system. You can make your own radial system or you can use the Hy-Gain Model 14 RMQ to give you an efficient radial system for the 14 AVQ.

THEORY OF OPERATION:

Automatic band selection of the 14 AVQ is accomplished through the use of "Hy-Q Traps". The Hy-Q Traps are parallel resonant circuits which effectively isolate the various sections of the vertical antenna to provide a perfect electrical 1/4 wavelength on all bands. The top hat on the 14 AVQ allows the antenna to exhibit broadband characteristics and to shorten the overall length by top loading.

NOTE

If you mount your antenna and find the roof space is too small for the radial system you can droop the radials over the edge of the roof at almost any angle without seriously changing the performance of the antenna. However, the radial system must be insulated from the roof and attached to a good ground.

MECHANICAL SPECIFICATIONS:

Overall Height.....19' 8 3/4" Max
Mast.....Accepts 1 5/8"
Wind Survival.....80 mph

ELECTRICAL SPECIFICATIONS:

Input Impedance.....52 ohms
SWR.....Less than 2.1
Power Capabilities.....1 KW AM
Lightning Protection.....DC Ground
Input Connector.....SO-239

NOTE

If the terminals of the input connector are checked with an ohmmeter they will show a direct short. THIS IS NORMAL! The matching coil in the antenna base puts the entire system at DC ground but presents a perfect 52 ohm impedance to RF energy.

INSTALLATION:

The 14 AVQ can be mounted on the ground, on the roof-top or on a mast. However, it should be noted that when mounting the antenna above ground you must use a ground plane (radial system). When the antenna is ground mounted a radial system is not needed in some areas, but where a good ground cannot be made using the method shown in Figure 2 you will need to lay out ground radials to improve the efficiency of your antenna. An alternate method is to use three more ground rods driven in the ground equally spaced about the antenna base. A good ground is absolutely imperative for any vertical antenna system.

STEP-BY-STEP ASSEMBLY:

() Be sure to read all of the preceeding information before assembly. Also acquaint yourself with the drawings in this manual by checking the parts as you take them from the carton.

NOTE

To prolong the life of this product in or around coastal areas, it is recommended that all hardware be encapsulated with a silicone rubber compound such as DOW-CORNING silastic rubber or G.E. silicone seal to prevent atmospherical deterioration.

() Determine at this time where you will mount your antenna (roof-top or ground) and what mode of transmission you will use (Phone or CW). Notice the dimensions inside this manual. Extreme care must be taken when making these measurements or the antenna will not operate at peak efficiency. The typical VSWR charts shown inside will help you decide which mode you wish to favor.

CAUTION

Once you have selected your mode of transmission (Phone or CW) you must use the same mode for all dimensions.

NOTE

The compression clamps used in this antenna are a universal device and are used in many varied applications. Depending upon the application, the screw head may or may not contact the lockwasher or clamp body. DO NOT OVER TIGHTEN the clamps in an attempt to contact the clamp body with the screw head. To do so may result in clamp failure or tube failure caused by puncture.

() Select the M1 Base assembly section (base section attached to 1 1/4 x 48" piece of tubing) and the 1 1/4" compression clamp with its associated screw and square nut. Slip the compression clamp over the top of the M1 section and install as shown in Figure #4. DO NOT TIGHTEN AT THIS TIME.

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() Select the four 1/4-20 x 3/4" screws, nuts and lockwashers and install on the base of the M1 section. If the antenna is to be ground mounted tighten these screws securely. If the antenna is to be roof mounted refer to Figure #5 and 6 before tightening these screws. A radial system MUST be added for proper operation when this antenna is mounted more than 24" above the ground. This radial system can also act as the guying system if insulators are used as shown in Figure #6. The radials must be the length shown after the strain insulators are installed. Two radial systems are shown but the preferred system will give much better results than will the alternate system.

- () Select the M2 section (1 1/8 x 44") and slip it into the M1 section of tubing. Measure dimension A as shown in the drawing according to your place of mounting and mode of transmission. Now tighten compression clamp SLIGHTLY.
- () Select the M3 section (1 x 9 1/2") and the 1 1/8" compression clamp. Slip the compression clamp on the M2 section then slip the M3 section into the M2 section. Measure dimension B as shown in the drawing according to your place of mounting and mode of transmission and then tighten compression clamp SLIGHTLY.
- () Slip a 1" compression clamp onto the M3 section but DO NOT TIGHTEN AT THIS TIME.
- () Select the 10 Meter trap (877132) and insert it into the M3 section in such a manner that the plastic cap is on the top. Measure dimension C and tighten the compression clamp SLIGHTLY.

NOTE

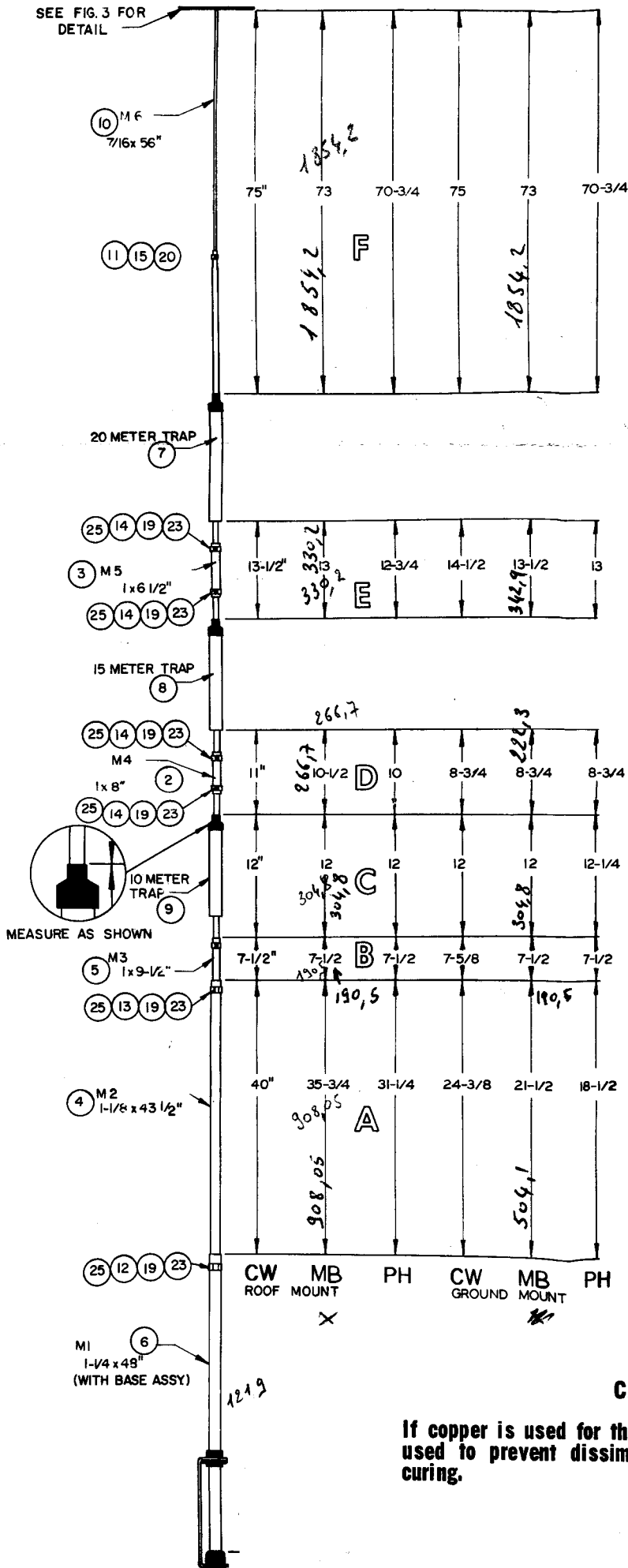
This radial system MUST be grounded. Connect the ground wire to a U-Bolt on the antenna base and run it by the shortest path to an 8' ground rod.

- () If the antenna is ground mounted install as shown in Figure #2, Install an 8' ground rod connected as shown.
- () The coaxial cable (RG-8/U) can be attached as shown in Figure #6 for roof and mast mountings and as shown in Figure #2 for ground mounting.
- () Be sure to weather seal the coax connection using Pli-O-Bond, neoprene, krylon or some similar substance to prevent moisture from shorting your coax.
- (-) For maximum lightning protection it is recommended that you use a Hy-Gain Model LA-1 lightning arrester available at your local Hy-Gain dealer.
- () This completes your installation.

- () Select the M4 section (1 x 8") and two 1" compression clamps. Slip the M4 section over the end of the 10 Meter trap then slip the compression clamps over the M4 section. DO NOT TIGHTEN AT THIS TIME.
- () Select the 15 Meter trap (877131) and insert it into the M4 section in such a manner that the plastic cap is at the top. Keep the M4 section approximately equi-distant from the two traps and measure dimension D...then tighten compression clamps SLIGHTLY.
- () Select the M5 section (1 x 6 1/2") and two 1" compression clamps. Slip the M5 section over the end of the 15 Meter trap then slip the compression clamps over the end of the M5 section. DO NOT TIGHTEN AT THIS TIME.
- () Select the 20 Meter trap (877129) and insert it into the M5 section in such a manner that the plastic cap is at the top. Keep the M5 section approximately equi-distant from the two traps and measure dimension E...then tighten the compression clamps SLIGHTLY.
- () Slip the 11/16" compression clamp on the swaged end of the 20 Meter trap. DO NOT TIGHTEN AT THIS TIME.
- () Select the M6 section (7/16 x 56" top ass'y) and slip the open end into the 20 Meter trap. Measure dimension F and tighten compression clamp SLIGHTLY.
- () Now check all the dimensions once again -- then tighten all compression clamps SECURELY.
- () Select the top hat radials (1/8" wire) and install as shown in Figure #3. Use the 10-24 x 1" screw, four #10 flat washers and the #10 lockwasher and arrange as shown in Figure #3. TIGHTEN SECURELY.
- () Place a 1/8" caplug on end of each radial.
- () Now install the two U-bolts using the 5/16" nuts and lockwashers as shown in Figure #2.

Item No.	Description	Qty
1	Radial, Top Hat, 1/8" Wire	3
2	M4, 1 x 8"	1
3	M5, 1 x 6 1/2"	1
4	M2, 1 1/8 x 43 1/2"	1
5	M3, 1 x 9 1/2"	1
6	M1, Base Ass'y with 1 1/4" Tube	1
7	Trap, 20 Meter	1
8	Trap, 15 Meter	1
9	Trap, 10 Meter	1
10	M6, Top Element Ass'y w/insert	1
	Parts Package	1
11	Clamp, Compression, 11/16"	1
12	Clamp, Compression, 1 1/4"	1
13	Clamp, Compression, 1 1/8"	1
14	Clamp, Compression, 1"	5
15	Screw, 10-24 x 1/2"	1
16	Screw, 1/4-20 x 3/4" HH	4
17	Screw, 10.24 x 1" RH	1
18	U-Bolt, 5/16-18	2
19	Screw, 1/4-20 x 3/8"	7
20	Nut, 10-24 Square	1
21	Nut, 5/16-18 Hex	4
22	Nut, 1/4-20	4
23	Nut, 1/4-20 Square	7
24	Lockwasher, 5/16" Internal	4
25	Lockwasher, 1/4" Internal	12
26	Lockwasher, #10 Internal	2
27	Washer, Flat #10	4
28	Caplug, 1/8"	3

SEE FIG. 3 FOR
DETAIL



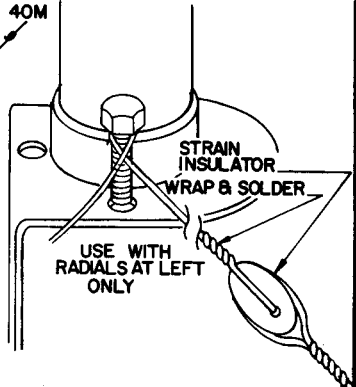
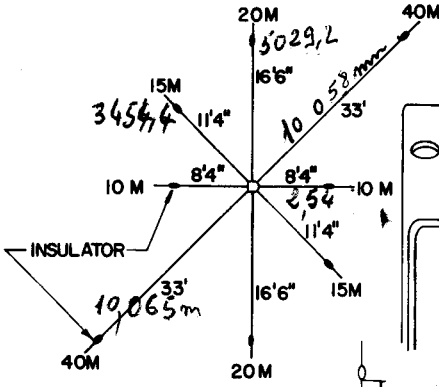
CAUTION

If copper is used for the radials, solder lugs must be used to prevent dissimilar metal corrosion from occurring.

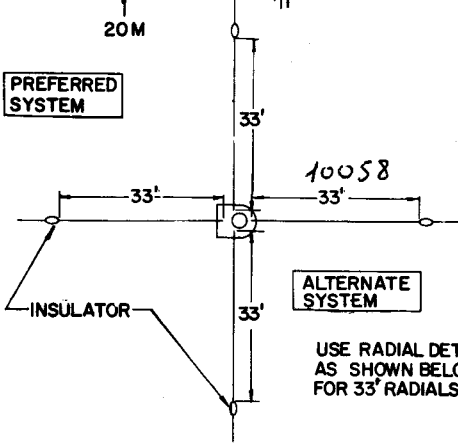
FIGURE 1

ROOF MOUNTING FIGURE SIX

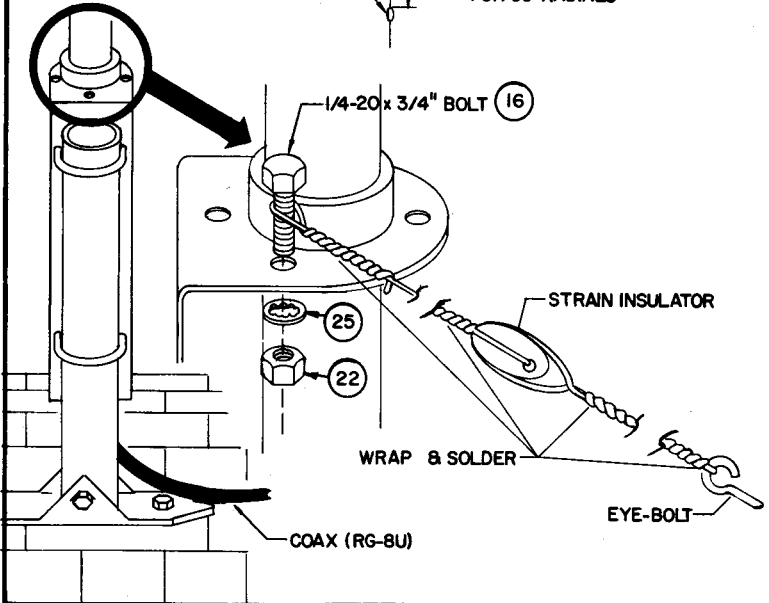
NOTE: RADIAL DIMENSIONS MEASURED FROM BASE TO INSULATOR.



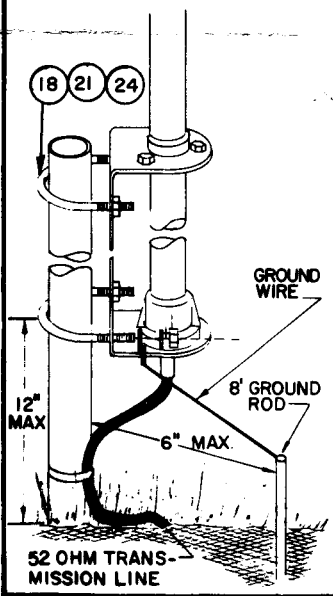
PREFERRED SYSTEM



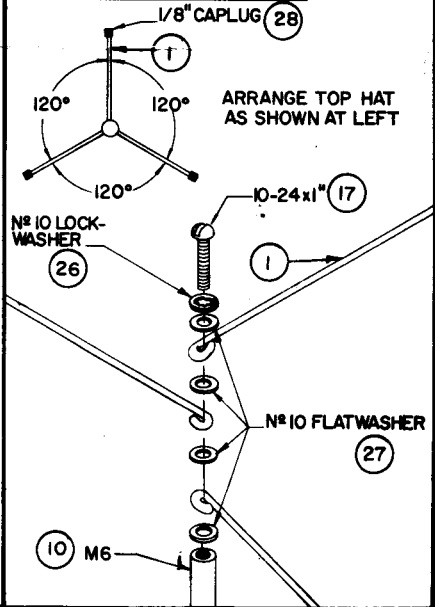
ALTERNATE SYSTEM



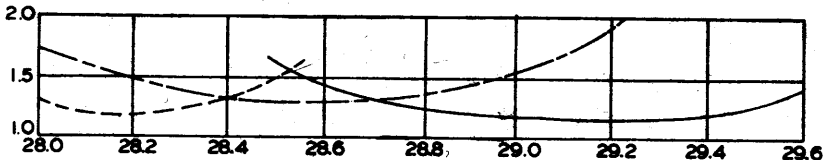
GROUNDING FIGURE 2



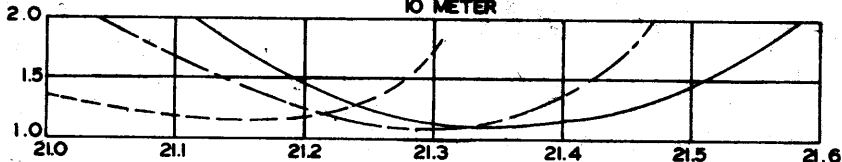
TOP HAT FIGURE 3



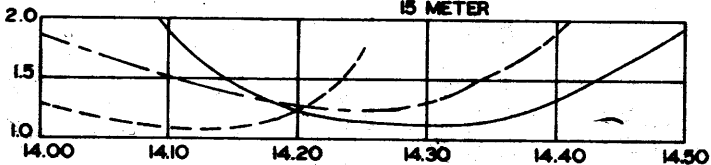
MB -----
 CW - - - - -
 PHONE =====



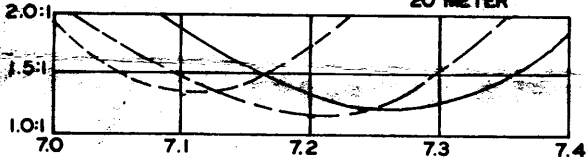
10 METER



15 METER

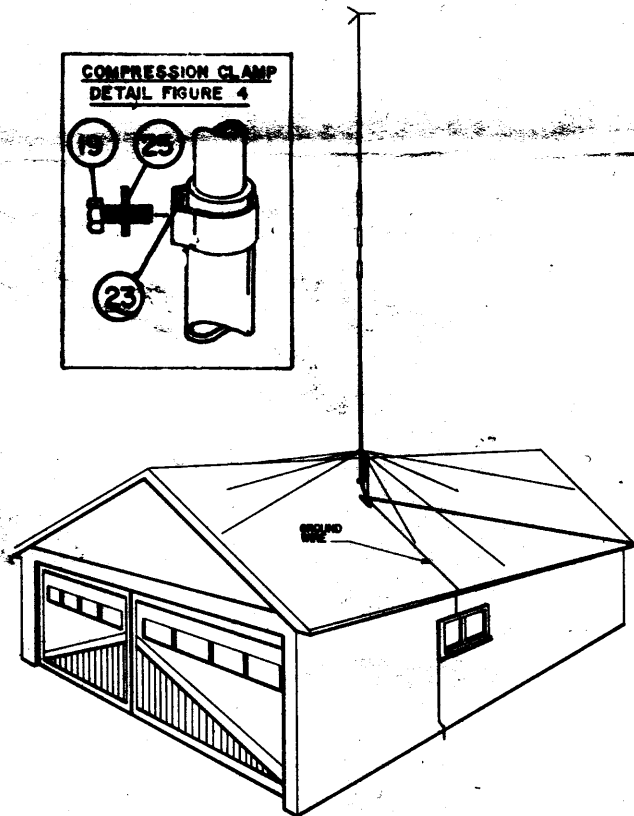
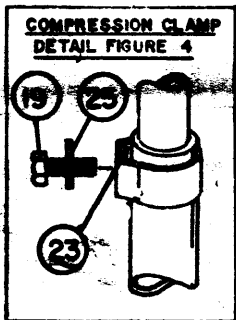


20 METER



40 METER

TYPICAL 14AVO VSWR CURVES



COMPLETED INSTALLATION OF 14AVQ FIGURE 5