Hy-gain

ORDER NO.

386

INSTALLATION & OPERATION INSTRUCTIONS

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GENERAL DESCRIPTION:

The Hy-Gain 18AVT/WB is an omni-directional self supporting vertical radiator designed to operate in the 80, 40, 20, 15 and 10 meter amateur bands. The system is designed to work against earth ground or a resonant radial system when mounted above ground. You can make your own radial system following the manual or you can use the Hy-Gain 14RMQ radial system kit.

THEORY OF OPERATION:

Automatic band selection is accomplished through the use of heavy duty "Hy-Q Traps" The heavy duty Hy-Q Traps are parallel resonant circuits which isolate the various sections of the antenna to provide true quarter wavelength resonance on all bands. The top hat and 80 meter resonator extends coverage to 80 meters and enhances the broad band characteristics by top loading.

MECHANICAL SPECIFICATIONS:

Overall Height.....6,4 m. 21' nominal

Mast.....Accepts 1 5/8" 41,5mm

Wind Survival.....80 mph 128km/h

ELECTRICAL SPECIFICATIONS:

Frequency.....80, 40, 20, 15 and 10 Amateur bands

Input Impedance.....52 ohms

SWR at Resonance.....Less than 2 : 1

Power Capabilities.....1 KW AM*

Lightning Protection.....DC . Ground

Input Connector.....SO-239

*Maximum power on 80 meters is 1 KW PEP

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 18AVT/WB 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.

If you mount your antenna and find the roof space is too small for a 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.

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.

( ) 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.

The performance of the 18AVT/WB is broadband with respect to VSWR. It is furnished with settings for both phone and CW operation. However, regardless of which set of dimensions are used for assembly, the system will cover the 40, 20, 15 and 10 meter bands at less than 2 : 1 VSWR. Nominal 80 meter 2 : 1 VSWR band pass will vary from 75 to 100 KHz, depending on frequency and installation factors. The 80 meter resonant frequency can be independently adjusted after final installation. For convenience, a chart of whip length verses typical resonant frequency is included.

CAUTION

Once you have selected your mode of transmission on (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.

( ) Select the M1 Base assembly section (base section attached to 1 1/4 x 60" 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.

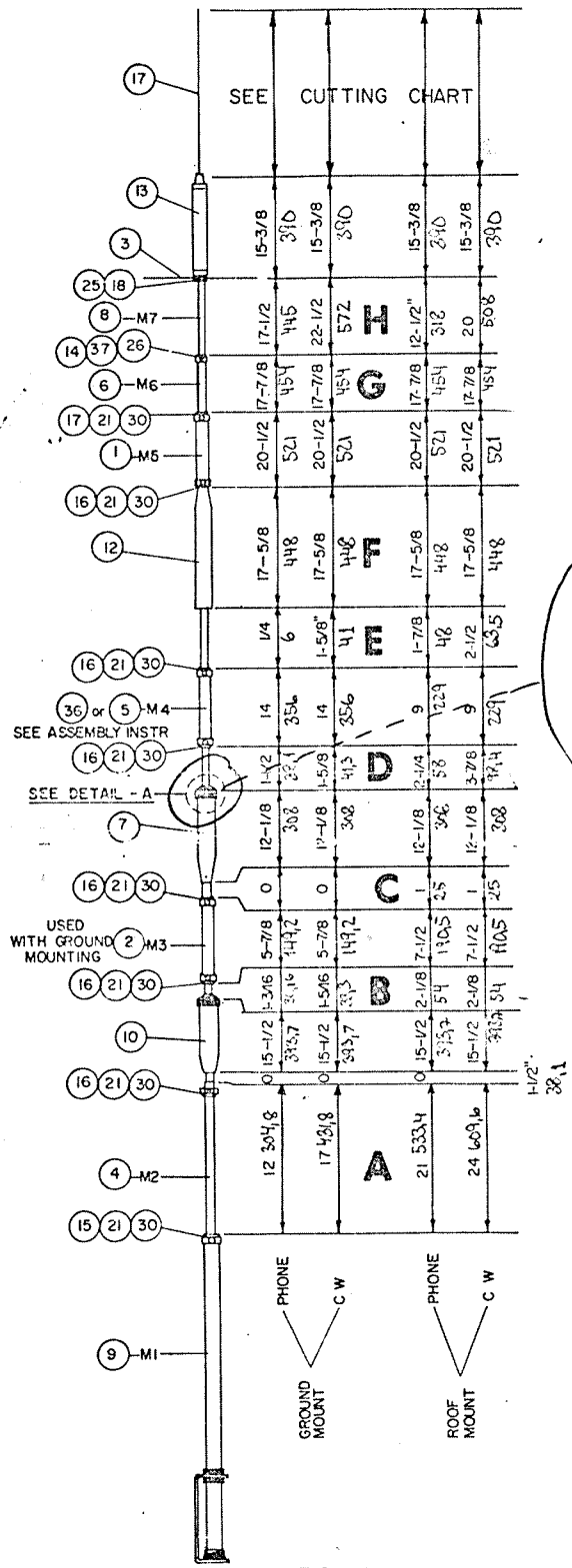


FIGURE 1

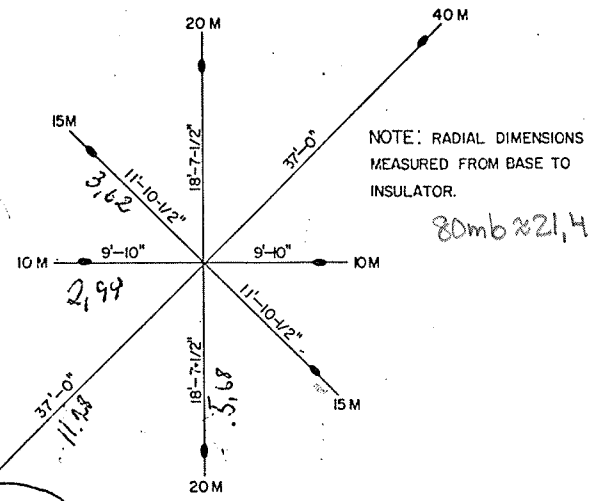
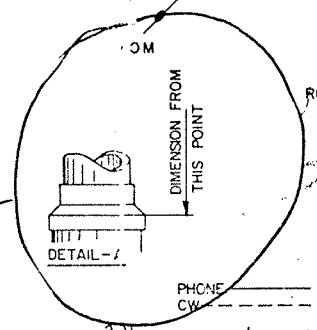
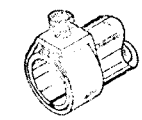


FIGURE 4
ROOF MOUNTING





COMPRESSION CLAMP DETAIL

ORIENT DRAIN HOLES IN TRAPS TO ALLIGN WITH SLOTS.

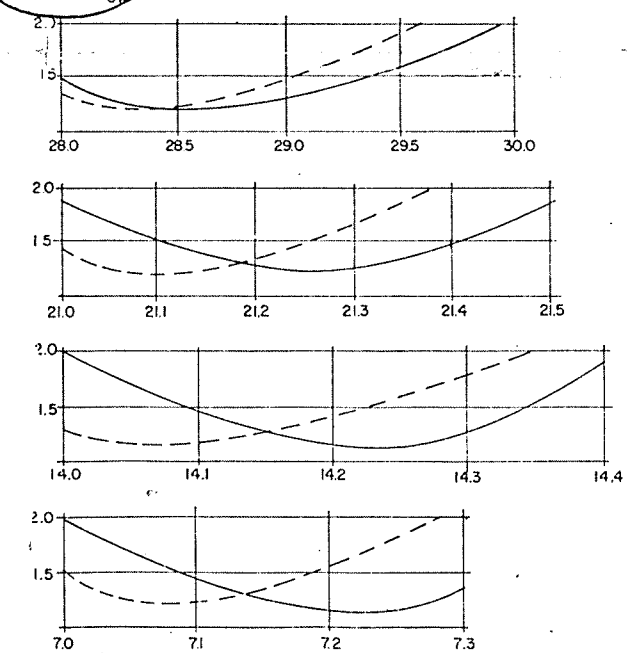


FIGURE 5
18 AVT/WB
TYPICAL VSWR CURVES

1 TUM = 0,0254 m
1 FOT = 0,3048 m

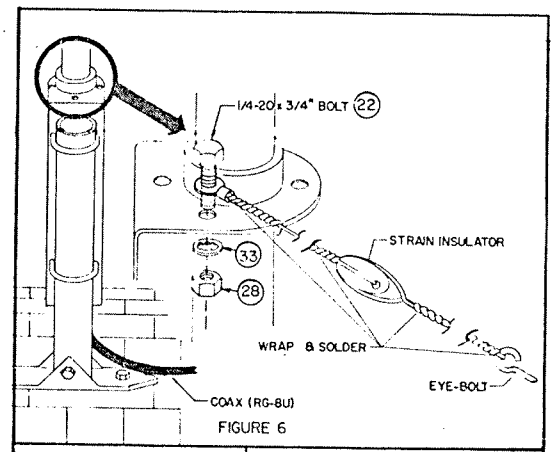
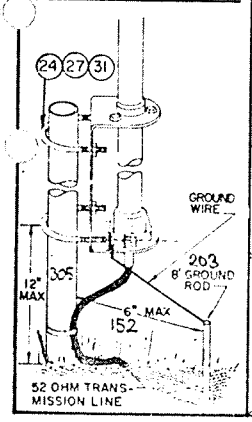
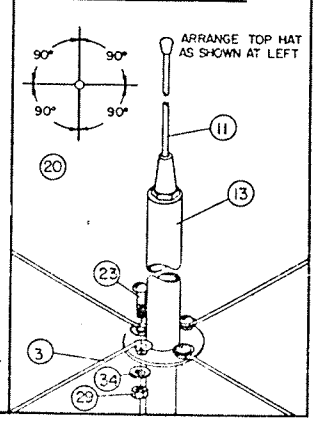


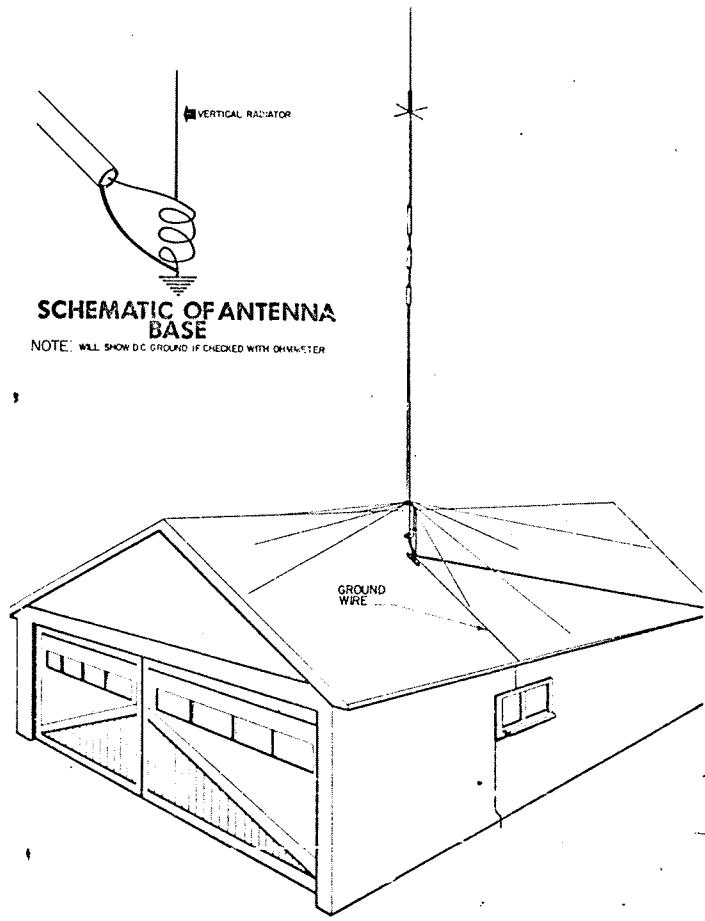
FIGURE 6

GROUNDING FIGURE 2



TOP HAT FIGURE 3





COMPLETED INSTALLATION

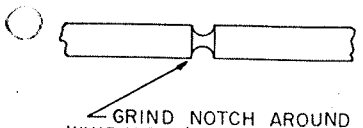


FIGURE 8

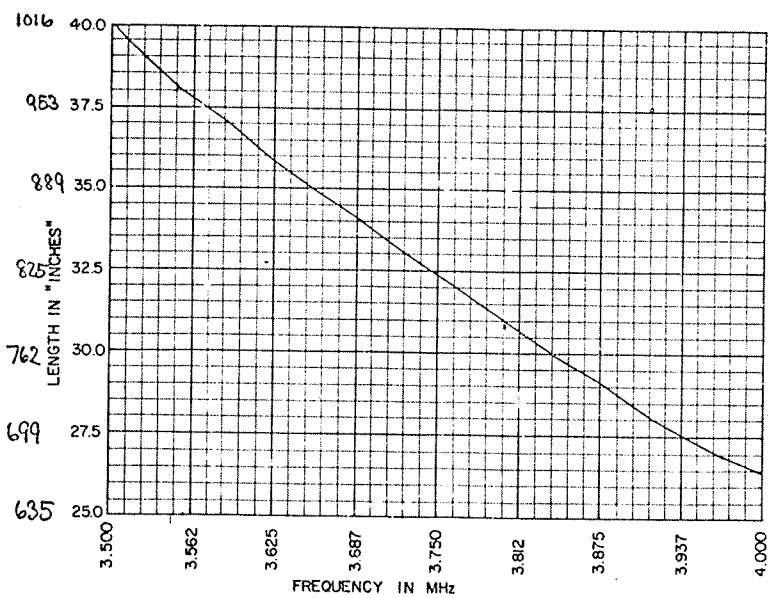


FIGURE 7

( ) Select the M2 section (1 1/8 x 26") and slip it into the M1 section of tubing. Measure dimension A as shown in the draw– and tighten the compression clamp SLIGHTLY.

( ) Slip a 1 1/8" compression clamp onto the M2 section but DO NOT TIGHTEN AT THIS TIME.

( ) Select the 10 Meter trap (870138) and insert it into the M2 section in such a manner that the plastic cap is on the top.

Set for dimension shown in Figure 1.

NOTE

When installing the traps, be sure to orient the drain holes to align with the slots in the tubing.

( ) Select the M3 section (1 1/8 x 5 7/8" for ground mount or 1 1/8 x 7 1/2 for roof mount) and two 1 1/8" compression clamps. Slip the M3 section over the end of the 10 meter trap then slip the compression clamps over the M3 section. Set dimension B and tighten the lower clamp slightly.

( ) Select the 15 meter trap (870135) and insert it into the M3 section. Set dimension C and tighten the upper clamp slightly.

( ) Select the M4 section (1-1/8" x 9") for roof mounting or the (1-1/8" x 14") for ground mounting and two 1-1/8" compression clamps. Slip the M4 section over the end of the 15 meter trap then slip the compression clamps over the M4 section. Set dimension D and tighten the lower clamp slightly.

( ) Select the 20 meter trap (870169) and insert the open end into the M4 section.

NOTE

The 20 meter trap is reversed in position from the 10 and 15 meter traps.

Set dimension E and tighten the upper clamp slightly.

( ) Select the M5 section (1 1/8 x 20 1/2"), one 1 1/8" and one 1" compression clamp. Slip the M5 section over the end of the 20 meter trap then slip the compression clamps over the M5 sec– tion. Set dimension F and tighten the lower clamp slightly.

( ) Select the M6 section (7/8 x 22 1/2") and 3/4" compression clamp. Slip the M6 section into the M5 section, set dimension G and tighten the upper clamp on M5 slightly.

( ) Select the M7 section (5/8 x 31"); and slip into the M6 sec– tion. Set dimension H and tighten the clamp on M6 slightly.

( ) Now check all the dimensions once again, then tighten all compression clamps.

( ) Select the top hat radials (1/8" wire) and install as shown in Figure #3.

( ) Place a 1/8" caplug on the end of each top hat radial.

( ) Select the whip assembly (870155) and screw into the white resonator coil.

( ) Refer to the chart, Fig. 7, and adjust the whip length for your desired frequency.

NOTE

The whip must be cut to the correct length. Do not push the rod down inside coil or you will short out the resonator and render it inoperative on 40 and 80 meters. Grind a notch around the rod and snap off as shown in the illustration.

( ) Screw the 80 meter resonator assembly onto the M6 tube us– ing a 3/8 x 24 x 1" stud.

( ) Now install the two U–bolts using the 5/16" nuts and lock– washers as shown in Figure #2.

( ) Select the three 1/4–20 x 3/4" screws, nuts and lockwas and install on the base of the M1 section. If the antenna is to ground mounted tighten these screws securely. If the antenna is to be roof mounted, refer to Figure #4 and 5 before tightening these screws. A radial system MUST be added for proper oper tion when this antenna is mounted more than 24" above arc This radial system can also act as the guying system if ins tors are used as shown in Figure #6. The radials must be length shown after the strain insulators are installed.

NOTE

This radial system MUST be grounded. Connect a ground wire to 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 Fig– ure #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 pre moisture from shorting your coax. To prolong the life of th ware in coastal areas or industrial atmosphere, it is recom ed that the hardware be encapsulated with a silicone rubbe pound, such as DOW–CORNING Silastic Rubber or G.E. Silicone Seal.

( ) For maximum lightning protection it is recommended th use a Hy–Gain Model LA–1 lightning arrestor available local Hy–Gain dealer.

( ) This completes your installation.