

# **INSTALLATION INSTRUCTIONS HUSTLER 4-BTV, 5-BTV TRAP VERTICAL**

## **WARNING INSTALLATION OF THIS PRODUCT NEAR POWER LINES IS DANGEROUS FOR YOUR SAFETY, FOLLOW THE INSTALLATION DIRECTIONS**

### **GENERAL DESCRIPTION:**

The Hustler 4-BTV is a four-band trap vertical antenna providing an omni directional pattern. The 4-BTV is designed as a self-supporting vertical to provide optimum operation in the 10, 15, 20 and 40 meter bands. It can also be adapted to operate in the 75 meter band. This antenna is designed for installations with restricted space.

The Hustler's 5-BTV is a five band trap vertical antenna adding 75/80 meter operation to the 4-BTV. This is achieved by adding the RM-80S resonator and 4457-1 spider assembly (see diagram page 3).

The Hustler 4-BTV provides electrical selection of bands through the use of optimum Q traps, which are individually and precisely tuned and internally sealed at the factory. Tampering with the traps will render your warranty null and void. The traps are parallel tuned circuits which provide efficient isolation between the vertical sections, permitting multi-band operation. Broadband operation over the entire ham band at very low SWRs is possible in a proper installation. Operation in the 75/80 meter band is provided by installing the appropriate resonator on top of the 4-BTV.

The Hustler 4-BTV was designed to provide optimum performance from both an electrical and mechanical standpoint. Mechanically, this antenna boasts a heavy duty base and heavy duty aluminum tubing. The mechanical assembly is accomplished with all stainless steel hardware. The use of clamps permits readjustment if necessary, and allows individual peaking of each band. The mechanical construction is such that guying is not ordinarily needed. If the 75 meter resonator is attached to the 4-BTV, it may be desirable to guy the antenna above the 20 meter trap with small diameter polypropylene rope.

The performance provided by the Hustler 4-BTV is better than any other antenna of this type. Broad banding is such that one measurement and setting permits both phone and CW operation. The antenna provides a nominal 52 ohm base impedance when installed and tuned according to the instructions. The radiation efficiency is equivalent to, or greater than, other trap verticals.

### **STEP-BY-STEP ASSEMBLY:**

1. Check the parts against the package contents listed on the following page.
2. Install mounting bracket on the support mast or stake. Tighten "U" bolts securely. Use lock washers and 1/4"-20 hex nuts (heavy nuts). Use 1-1/4" I.D. water pipe or other very strong support.
3. Accurately cut radial lengths (if needed or desired) in accordance with radial length table (Fig. 6).

## PACKAGE CONTENTS

<b>Qty.</b>	<b>Part Number</b>	
1	4098-1	Bracket Assembly
1	4190	Top Tube Section
1	4087-1	Lower Tube Section
2	4087-2	Intermediate Tube Section
1	4090-1	Ten Meter Trap
1	4090-2	Fifteen Meter Trap
1	4090-3	Twenty Meter Trap
6	5481	Spider Tubes
1	4198	Accessory Kit Consisting of the Following:

### IN PLASTIC BAG

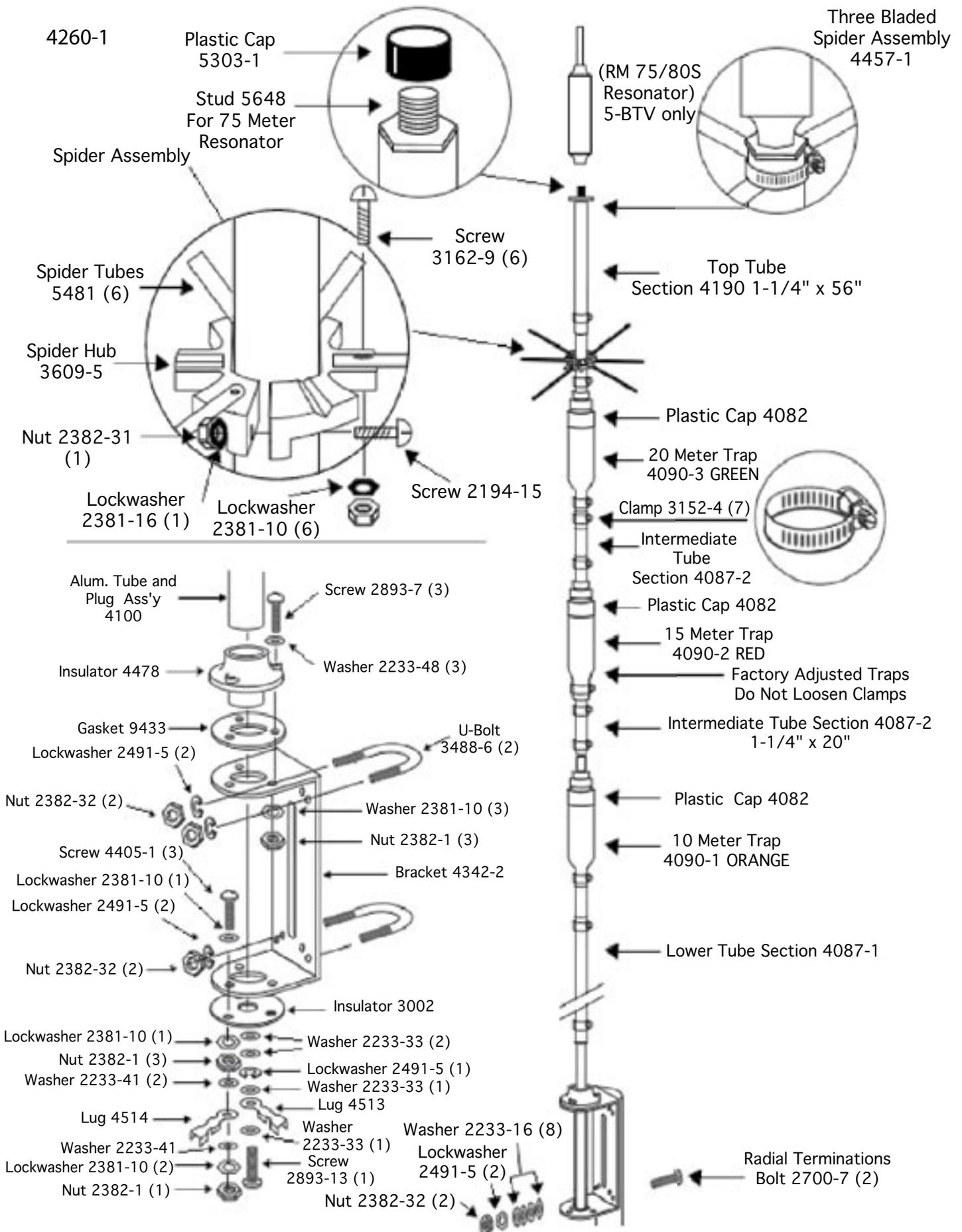
7	3152-4	Clamp, #12, SS
2	3488-6	"U" Bolts
4	2491-5	Lock washers 1/4" Split
1	3609-5	Spider Hub
1	2194-15	Screw 6-32 x 3/4"
1	2382-1	Nut Hex, 10-32 SS
7	2832-31	Nut Hex, 6-32 SS
4	2832-32	Nut 1/4-20 x 7/32" Thick
1	4513	Terminal Lug 1/4" Hole
1	4514	Terminal Lug #10 Hole
6	3162-9	Flat Head Screw 6-32 x 5/8"
2	2233-41	Washer 1/2" O.D. x 3/16" I.D.
7	2381-16	Lock washer Ext. #6 SS
1	6099	Danger Label

### IN PLASTIC BAG FOR RADIAL MOUNTING

2	2700-7	Hex Head Bolt 1/4-20 x 1-1/2"
8	2233-16	Washers 5/8" O.D. x 1-1/4" I.D.
2	2491-5	Lock washer 1/4"
2	2832-32	Nuts 1/4-20 x 7/32" Thick

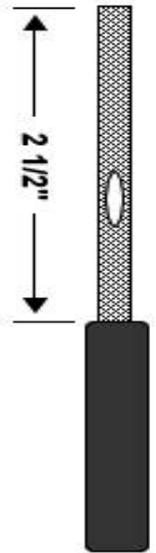
This PDF courtesy of





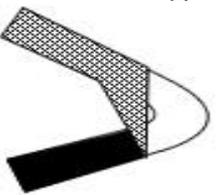
## Recommended Method of Preparing Coax

Separate strands of braid with an awl being careful not to break any.



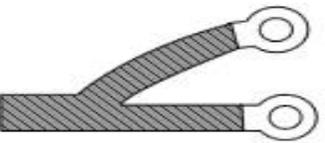
**Figure 2**

Draw center conductor out with an awl or dull pointed instrument.



**Figure 3**

Lug with 3/16" dia. Hole on shield end.

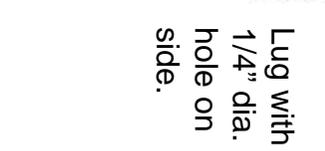


Solder on the size lugs as indicated above.

Tape tightly with plastic electrical tape.

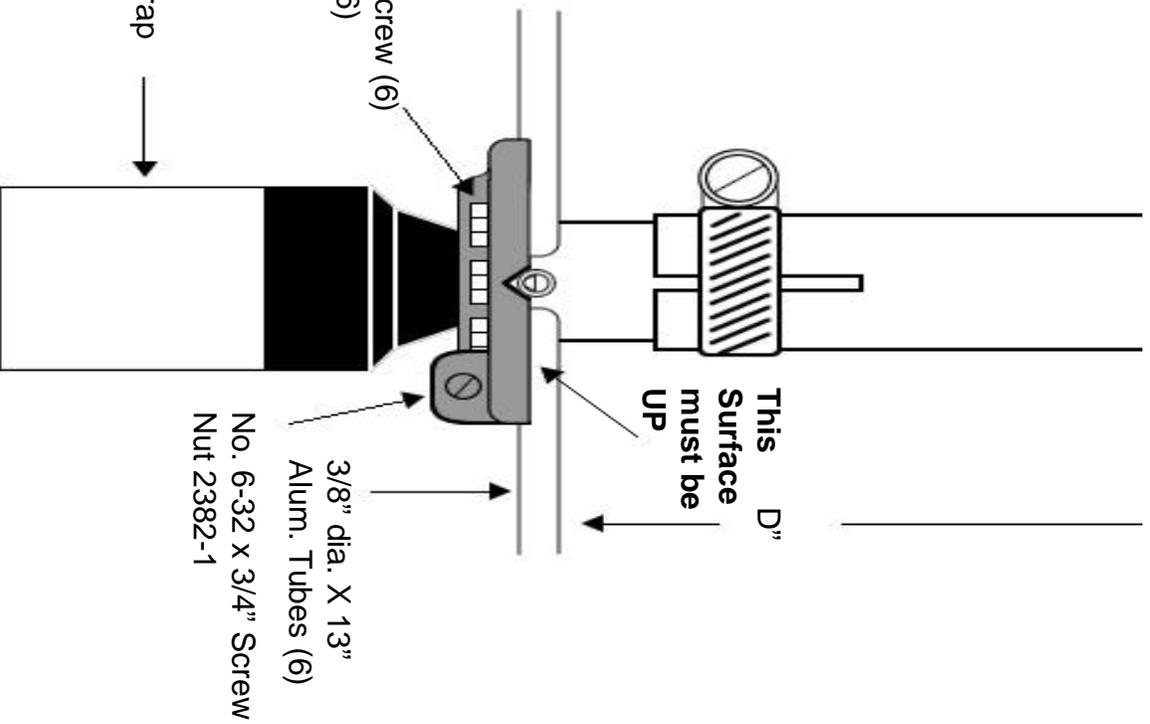
After installing coat with sealant

Lug with 1/4" dia. hole on side.



6-32 x 5/8" Screw (6)  
Nut 2382-1 (6)

20 Meter Trap



This "D" Surface must be UP

3/8" dia. X 13" Alum. Tubes (6)

No. 6-32 x 3/4" Screw  
Nut 2382-1

**Figure 4**

**Figure 5**





4. Prepare split lead on coax in accordance with Figure 2 and 3. RG-8U coax is recommended.
5. Install lugs on coax as shown in Figure 4 and weatherproof with electrical tape.
6. Install coax feed line and radials as shown in Figure 6.
7. After making all connections to the mounting bracket, a heavy protective coating such as Krylon clear spray would be very advantageous.
8. Assemble the 3/8" x 13" tubes to the hub as shown in Figure 5, using the 6-32 machine screws, number 6 lock washers and the 6-32 hex nut.
9. Install the 10 meter trap to the 1-1/4" x 72" tube, using one of the clamp assemblies. Set to dimension A and table in Figure 7, the measurement should be made at the end of the long tube and the bottom edge of the trap. Securely and carefully tighten the clamp.

### **IMPORTANT**

**THE PLASTIC CAP IS THE TOP OF THE TRAP AND MUST BE INSTALLED IN THAT POSITION, THE CLAMP AT THE BOTTOM OF THE TRAP SHOULD NOT BE LOOSENED. THIS WOULD UPSET TRAP CALIBRATION.**

10. Install #12 clamp at each end of one of the 1-1/4" x 20" tubes and slide over the tube of the 10 meter trap. Install the 15 meter trap in the opposite end of the same tube and set both dimensions B from table in Fig. 7. The measurement should be made from the upper most edge of the plastic cap to the bottom edge of the 15 meter trap. Securely tighten clamps.
11. Install the second 1-1/4" x 20" tube, complete with clamps, on the 15 meter trap and then install the 20 meter trap in the top of that tube. Set to dimension C from the table in Fig. 7, again measuring from the top of the plastic at the bottom of the tube, and from the top of the tube to the bottom edge of the trap.
12. Install spider assembly as shown in Fig. 5, it should be flat against the top of the 20 meter trap cover. Securely tighten the 6-32 x 3/4" screw with lock washer and hex nut.
13. Install the 1-1/4" x 56" tube to the 20 meter trap and set to dimension D from table in Fig. 7. Securely tighten clamps.
14. Each clamp should be installed near the edge of the tubing to obtain the best mechanical and electrical connection. Re-check all bolts to insure tightness. Re-check all dimensions against table in Fig. 7.
15. Install assembled antenna on mounting bracket and set the bottom dimension A, from table in Fig. 7, and securely tighten clamps. Never allow the mast on which a 4-BTV is mounted to extend above the bracket.

## INSTALLATION:

### **READ THE ATTACHED SAFETY WARNING ON LAST TWO SHEETS BEFORE PROCEEDING FURTHER**

An important part of any vertical antenna is its ground plane. While the Hustler 4-BTV was designed as a space saver, we recommend one of the following installations from a performance viewpoint.

1. For optimum performance, roof mount with radials. Roof mounting of the antenna will provide height which, in turn will generally provide better transmission and reception.

The 4-BTV can be mounted on a ground mounted tower, heavy duty chimney clamp, wooden pole, short roof mounted tower or other suitable support assembly. Try to locate the antenna 10-15 feet away from non-metallic structures.

**CAUTION:** Mounting the 4-BTV on towers, tripods, or large mast pipes, approximately a quarter wave in length, can often provide an upset to the counterpoise created by the radial system, and act as a vertical dipole instead of the desired ground plane. To correct this problem, the radial system must be R.F. isolated from the mounting structure. This may be done by using a non-conductive mounting mast, such as heavy wall fiberglass tube or fiberglass rod or by sliding a split piece of PVC pipe over the metal mast. The coax or mounting bracket should not be directly grounded.

The 4-BTV installation is most easily accomplished by installing the base only to your support assembly. After connecting radials and feedline to the base, the 4-BTV can be attached to the base.

Using the radial length table (Fig. 6) install two insulated wire radials for each band used. It is recommended that the radials be constructed of large diameter insulated wire, 14 gauge is usually ample.

When radials are installed they should be equally spaced around 360 degrees with radials of equal length opposite each other. Never bunch radials as one will detune the other. They should be attached to the base mount in accordance with Figure 6.

Care should be taken to make a good electrical connection at the antenna bracket. When radials are used in a roof mount configuration, every attempt should be made to permit a 45 degree droop angle below horizontal.

This is accomplished by choosing a mounting pipe or short tower long enough to make these angles possible. If space is limited, some compromise is permissible providing the droop angle is held between 10-60 degrees below horizontal with radials fanned out as much as possible.

If space is severely restricted, radials may be zigzagged or run in an "L" configuration avoiding near parallel wrap back less than 90 degrees.

1. The importance of the ground system cannot be over-emphasized. The ground or radial system must be considered as half the antenna.

When radials are used, high impedance will exist at the ends of the radials, and adequate insulation must be provided, or their purpose will be defeated. Tie them off using a non-conductive material such as polypropylene rope or heavy gauge fishing line. In a case where the antenna or the radials are mounted over or near metallic objects the radials must be insulated or mounted at least 4 in. over the roof.

2. Second Choice, ground mount with radials; if you are unable to mount the antenna in the preferred roof mount configuration, the second best choice would be that of ground mounting. In ground mounting it is important to choose a location reasonably free from obstructions such as houses, metal fences, trees, wires, vertical downspouts, aluminum siding, other antenna, etc. Try to maintain at least a radius of 10-15 feet of clear area around the antenna. It is recommended that the 4-BTV be mounted on a 4 foot metal stake such as a 1-1/4" I.D. Water pipe. Do not exceed this length. This stake should be buried in the ground with 18 inches left protruding. (Do not concrete or put into a pre-dug hole. Drive it into the ground.) Position the 4-BTV base on this pipe to a location not exceeding four inches of separation between earth and coax connection. Do not try to use a network of ground rods around the base of the antenna. If the ground supplied by this pipe is not sufficient, radials must be employed.

The radials in this type of installation will provide a better overall performance than that of stake mount only. Ground mount radials may be either buried a couple of inches below the surface or left on top of the ground. If they are left on unburied, power equipment (such as lawnmowers) or pedestrian traffic could become entangled in the wires.

Using the radial length table, Fig. 6, install two insulated radials for each band. It is recommended that the radials be constructed of large diameter wire; #14 gauge is usually sufficient. The radials should be spaced around the base 360 degrees with radials of equal length opposite each other. Never bunch radials, as one will detune the other. They should be attached to the base mount in accordance with Figure 6. Any wire droop on the ground need not be of concern.

Least Desirable, ground mount without radials. If you do not have sufficient space and are unable to use a ground radial system, ground mounting of the antenna on a 4 foot ground stake driven into the ground with only 18 inches protruding, will provide good performance, which in turn, will be in direct ratio to the ground conductivity and soil conditions in your particular area.

In ground mounted location, performance (SWR, bandwidth and radiation efficiency) is directly related to ground conductivity. If the ground conductivity is good, you obviously will obtain better results. As stated previously, the 4-BTV was expressly designed to give you satisfactory performance even in this configuration. Therefore, if ground mounting without radials is a necessity, you can still obtain better performance from the 4-BTV than obtainable from any similar antenna.

NOTE: Adding more pairs of radials than the 2 per band prescribed in instructions, may result in obtaining better results for DX'ing.









