



*Horizon UltraLite*TM

HF Vertical Dipole

Horizon Antennas

INSTRUCTION MANUAL



DANGER: Do not install this antenna where there exists the possibility of contact with power lines. Even with nickel-plated antennas, the risk of shock exists, which could cause serious injury or death.

Due to continual product improvements, the information in this manual is subject to change any time without notice. Horizon Antennas will be held free from liability, any problems arising from the use of this manual, or the products described herein.

Manual Rev V1.2

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Horizon Antennas ULTRALITE

1 Limited Warranty

Horizon Antennas warrants to the original owner of this product if purchased from an authorized dealer or directly from Horizon Antennas to be free from defects in material and workmanship for a period of 12 months from date of purchase, provided by a dated proof of purchase.

Horizon Antennas agrees to repair or replace, at Horizon Antennas' option, any defective product still under warranty. Horizon Antennas will cover return shipping only. The warranty becomes null and void if it is determined that the product was subject to conditions beyond what the product is rated for, including, but not limited to, over-power limits, extreme environmental conditions such as flood or fire, or general misuse.

Horizon Antennas will repair or replace, at Horizon Antennas' discretion, any out-of-warranty Horizon Antennas product provided all parts, labor, or other repair costs are provided by the customer, the amount of which is determined by Horizon Antennas.

All repairs, in warranty and out-of-warranty, should be sent to Horizon Antennas along with a brief description of the problem and the circumstances, environmental conditions, and equipment used at the time the problem occurred. For warranty product repairs, a dated proof of purchase must also be supplied.

Horizon Antennas will not be held liable, under any circumstances, for damages resulting from the use of any Horizon Antennas product.

Horizon Antennas reserves the right to make changes to this product, in part or in whole, at any time, in form, function, or manufacture, without obligation to install or incur any costs relating to the installation of modified parts onto existing product.

This warranty gives you specific rights. Other rights may apply, which vary from state to state.

2 Specifications

Congratulations on the purchase of your Horizon UltraLite HF antenna! The UltraLite represents a revolutionary jump in HF antenna performance, convenience, and reliability. The artfully crafted UltraLite was designed with ease of use in mind. Therefore, all UltraLite antennas are pre-assembled and tuned at the time of manufacture. With its compact four-part fold-up design, the UltraLite is ready to go right out of the box for permanent installation, or quick and easy travel, using the optional Quadrapod travel stand.

The UltraLite is a center-fed vertical dipole antenna with a very low radiation take-off angle (around 27 degrees above horizontal), allowing for very long distances on the HF bands. The Horizon UltraLite is a ground-mounted omni-directional antenna, requiring no ground radials, tower, or rotor.

2.1 Mechanical

Dimensions (folded)

Four pieces, each less than 48" long.

Antenna Dimensions (after setup)¹

Width:	76" (6' 2")
Height:	100" (8' 4") includes 24" mount
Weight:	Appx: 4.7 lbs.

2.2 Electrical

Transformer

Function:	40m through 10m Some bands may require transceiver's tuner.
Requirements:	High Quality RG-8 or RG-8X feedline

¹ Not including the optional QuadraPod which weighs 4.7 pounds and is (folded) 34" x 4" x 4" plus the 5-way.

2 Specifications *(cont.)*

Electrical *(cont.)*

Mode	Maximum Power
SSB	1200 PEP
CW	375 W
RTTY	350 W
AM	375 W, 100% mod (full legal)

Band	Band Width	VSWR
10 M	Entire Band	1.4:1 to 1.8:1
12 M	Entire Band	1.7:1
15 M	Entire Band	1.1:1
17 M	Entire Band	1.2:1
20 M	Entire Band	1.1:1
30 M	Entire Band	1.1:1
40 M	Entire Band	2.9:1 to 3.0:1

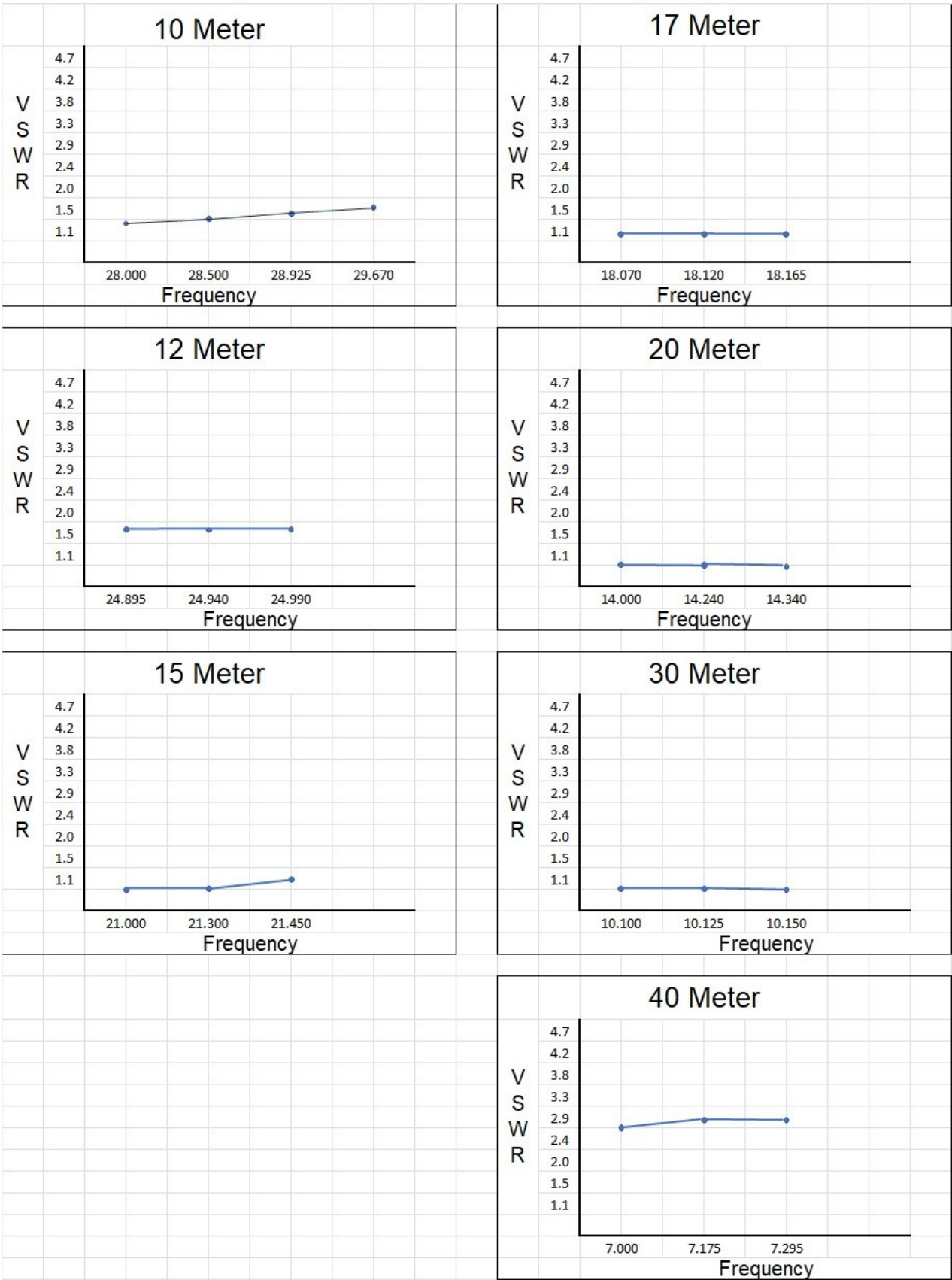
These results are without a tuner

Directionality: Omni directional
 Vertical radiation angle: 27°
 Band selection: Transceiver and Transformer controlled

The seven plots above represent the VSWR performance of the antenna under the test circumstances noted on footnote 2. The term “bandwidth” here refers to the range of frequencies over which the antenna exhibits a VSWR of 1.5:1 or less

SWR	Percent Loss	Watts Available
1.0:1	0.0%	100.0
1.1:1	0.2%	99.8
1.2:1	0.8%	99.2
1.3:1	1.7%	95.3
1.4:1	2.8%	97.2
1.5:1	4.0%	96.0
1.6:1	5.3%	94.7
1.7:1	6.7%	93.3
1.8:1	8.2%	91.8
2.0:1	11.2%	88.9
2.2:1	14.2%	85.9
2.4:1	17.0%	83.0
2.6:1	19.8%	80.2
3.0:1	25.0%	75.0

2.3 VSWR Performance



VSWR: 40M-10M

3. The Components of your Antenna

The structure of your antenna has been built in four pieces: top, middle, bottom, and ground mounting assembly. The top and bottom pieces fold up for quick and easy travel. Fold-up and assembly of the four main structure pieces is achieved using pre-installed clamp knobs. See below for a summary of these four components.

Top Section

37" x 6.25" x 2.25"

Middle Section

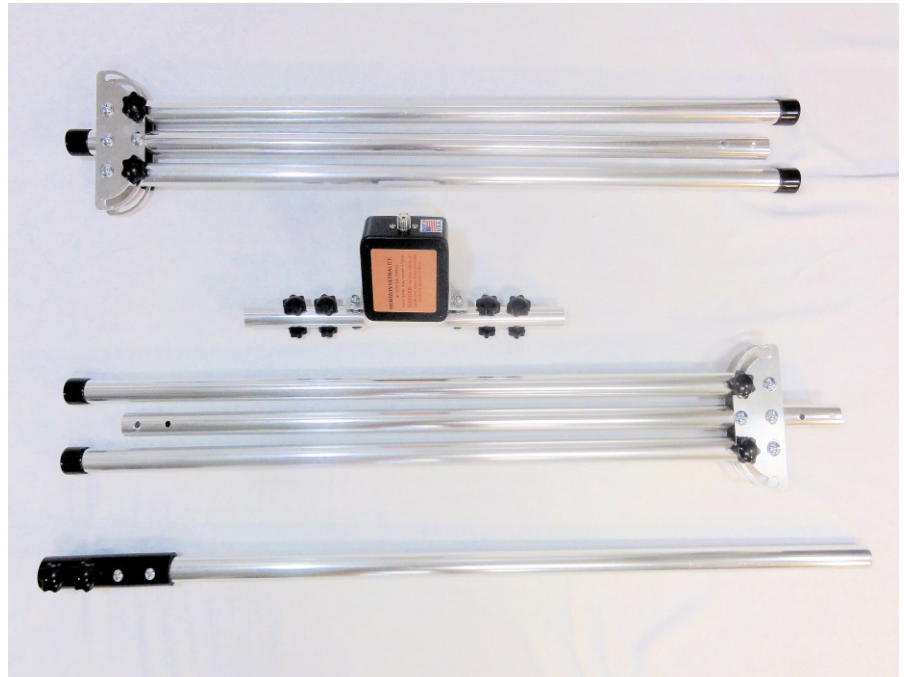
16" x 5.625" x 3.625"

Bottom Section

38" x 6.25" x 2.25"

Permanent Mounting Assembly

46.00" x 1.5" x 2.25"



4. Getting Started

4.1 Tools Needed

Under normal circumstances, no hand tools should be required for setup, breakdown, or transport of the Horizon UltraLite. Should a bolt become loose, a simple Phillips screwdriver can remedy.

4.2 Antenna Setup

Getting started with your new UltraLite is quick and easy. Follow these steps to get started using your new antenna right away.

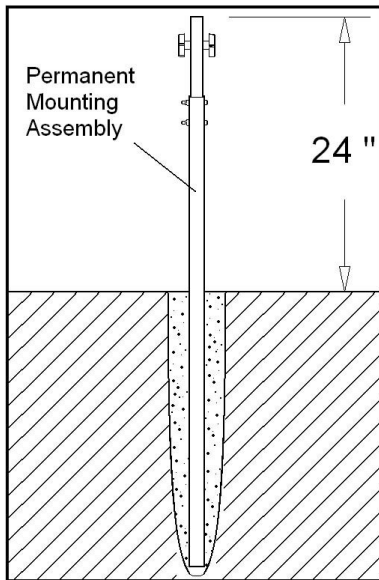
- 1) Choose a location for your antenna.** The area you choose for your antenna should be at least 10 meters (at least **30 feet**) from any metal structure or other objects that could detune the antenna.

 **Danger:** *The antenna should not be placed anywhere near power lines, as serious injury or death could occur.* And as always, CALL BEFORE YOU DIG to ensure you know where buried gas, water, sewer, power, and other service lines are located.

 **Danger:** As with any antenna installation, exposure limits should be calculated to ensure safe operation. Vertical dipoles, such as the Horizon UltraLite should not be operated at more than about 200W on 20M. Visit the ARRL website (<http://arrrl.org/rf-exposure-calculator>) for more information on exposure limits and calculations.

The antenna's coax feed line should be run at a 45-degree angle down from the structure to the ground to minimize parasitic coupling (see figure, page 11). **FAILURE TO DO SO WILL RESULT IN HIGHER THAN EXPECTED VSWR READINGS.** Plan for this extra footprint when choosing a location for your antenna.

- 2) The supplied Permanent Mounting Assembly consists of insular tubing connected to an aluminum rod using stainless steel hardware. The assembly can be installed with or without the use of concrete. Though concrete will provide a more secure, permanent base for your antenna, it will be difficult to remove or re-position later. The assembly should be inserted about 12-24" into the ground, **exposing 24-30" of the assembly above ground.**



It is suggested that the antenna be tried in an area using the permanent mounting assembly in a hole in the ground before concreting, in case the antenna needs to be moved later. Once you are sure of the location for the antenna, the Permanent Mounting Assembly can be concreted into place, if desired.

Warning: The nickel-plated rod is *not* hammer-proof. Do not pound the Permanent Mounting Assembly into the ground like a stake. Permanent damage to the PVC or nickel rod could occur.
Note: for ease of movement, a five-gallon bucket filled with sand or gravel will provide a more portable mount.

- 3) **Assemble antenna.** First, attach the bottom section to the middle section, making sure to slide the pieces completely together. The $\frac{1}{4}$ " holes in the middle section should correspond completely with the holes in the bottom section, as shown in step 1 below. Tighten the clamp knobs snugly. Next, attach the top section to the middle section by sliding the middle section into the top section, matching the holes. As you did with the bottom section, tighten the star knobs tightly. Finally, fold the arms of the top and bottom sections out as shown in step 3. The arms should be folded out completely horizontal. **Firmly tighten all four clamp knobs to ensure that the top arms do not rotate downward over time, and that continuity is provided to all parts of the antenna.**

Controller Connection Details

1

Attach the bottom to the middle section, by sliding the rod from the bottom section over the top of the center section, lining up the holes and attaching with the star knobs.



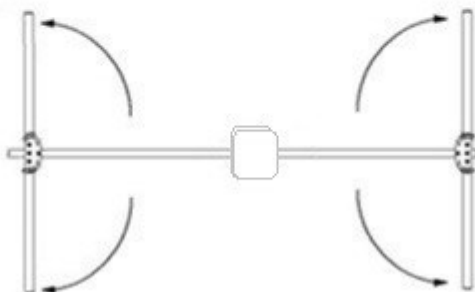
2

Attach the center section to the top by sliding the rod into the top piece and lining the holes up. Snugly attach the star knobs.

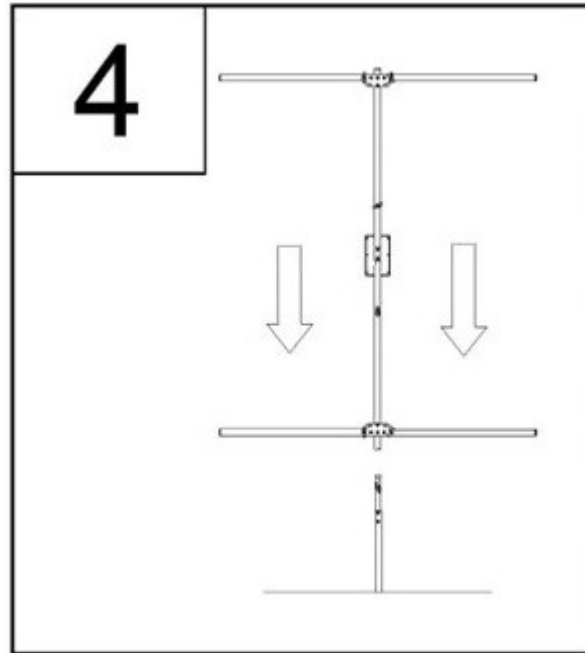


3

Loosen arm star knobs. Fold the arms out flat, like the picture below, and insert the star knobs in the upper holes. Retighten the arm star knobs.



4) Install antenna onto the Permanent Mounting Assembly. As shown at right, slide the bottom of the bottom section into the Permanent Mounting Assembly's insular tube, matching the holes. Slide the clamp knobs through the holes and firmly tighten.



4.3 Connections

⚠ Warning: Turn off equipment before making or removing any connections. Failure to do so could result in equipment damage.

Ground connection. For reduced noise and RF exposure in your shack, all equipment should be grounded to **one common point** on a water pipe or a copper ground rod driven into the earth.

Feedline. Connect at least a 65' length of RG-8 or RG-8X to the SO-239 port on the center section on the bottom of the transformer.

Final connection notes: The coax cable should feed the antenna at a **45-degree angle** as shown in the figure at right. Failure to do so will result in parasitic coupling and will cause *higher than normal VSWR readings*.



5. Adjustments

 **Danger:** Do not apply RF power to the antenna while anyone is standing near the antenna. RF burns or electrical shock may occur, causing severe injury or death.

Equipment. The testing process may utilize Voltage Standing Wave Ratio (VSWR) measurement. These measurements can be accomplished using most any antenna analyzer. However, these devices typically generate a very small signal (less than 0.2W) and may show higher than expected VSWR readings. A reading of 1.5:1 at the tuned frequency is typical at this low power. The VSWR readings should decrease once the antenna is used with 10W of power or more. The VSWR reading on your transceiver will likely show a lower VSWR than a low-power antenna analyzer.

Cables. Make sure that the coax used for the adjustment process is at least 65 feet long, and that the coax is installed at a 45-degree angle as described on **page 11**. Do not allow loops or coils in the cable, as this may create an RF choke. The feedline neither radiates nor acts as a counterpoise for the antenna.

Avoiding Coupling. Due to parasitic coupling, installing your antenna on a metallic stand may cause the tuned frequencies to differ from those of a permanent installation. If a non-permanent mounting is required, we recommend our Horizon non-metallic QuadraStand or QuadraPod.

Operation Checklist: If adjustment proves difficult, follow this checklist to eliminate common problems.

☐ Is your antenna placed at least 30 feet away from other objects such as buildings, people, trees, etc.? The ends of the antenna arms are very sensitive to coupling with external objects.

☐ Is your antenna installed such that the arms are at least 24 inches off the ground? The spacing between the antenna's lower arms and the ground should be between 24 inches and 30 inches.

☐ Is your coax cable a high-quality RG-8 or RG-8X cable?

- ☐ Is your cable long enough? At least 65-feet of coax should be used for best results.
- ☐ Is your coax installed at a 45-degree angle with respect to the antenna as pictured in the figure on page 11?
- ☐ Are you checking the VSWR using at least ten watts? Once at least ten watts is applied to the antenna, VSWR readings may improve significantly.

6. Accessories



Horizon UltraLite™ QuadraStand

Four legged furniture-grade portable PVC stand (24" tall, 70" x 70" footprint) Quick assembly and disassembly. Fits in Travel Bag.



Horizon UltraLite™ QuadraPod

Four legged furniture-grade portable PVC stand (22" tall, 70" x 70" footprint) Quick assembly and disassembly. Fits in Travel Bag.



Horizon UltraLite™ Travel Bag

Handy travel bag to carry your UltraLite backpacking or on field day outings.

7. Contact Information

If you need to contact Horizon Antennas, just drop us an email at:

support@horizonantennas.net

Use this email address for help with installation, setup, adjustment, or operation, for product or company information, or warranty/money back guarantee claims.

Check back at our website frequently for product updates at:

www.horizonantennas.net

We can also be reached through our web-based contact system on the website.