

40 Meter Vertical Antenna

COM-40VA

COM-40VA-INS-Revision 2

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1200 Southeast Ave. - Tallmadge, OH 44278 USA
Phone: (800) 777-0703
Technical Support and International: (330) 572-3200
Fax: (330) 572-3279
E-mail: Info@comteksystems.com

Congratulations! You are now the proud owner of a Comtek 40 Meter Vertical Antenna.

Specifications:

- Full band coverage on 40 meters with SWR under 1.5:1 No Tuner needed
- Bandwidth greater than 750 kHz with SWR under 2:1
- Power Handling up to 5 kW
- Weight: Approximately 15 pounds
- Element Tubing: 6 element sections sized from 2" OD to 1.375" OD
- Less than 35 ft overall height
- Tunable above and below 7 MHz range for MARS and CAP frequencies

Parts List:

Description	QTY
Aluminum Mounting Plate, 12" x 8" x 1/4", Drilled	1
Element Insulator, EXTREN [®] , 2.5" OD x 2" ID x 2" long, Split	2
Aluminum Cast Saddle 2.5", for Element Insulator	2
Stainless Steel U-Bolt 2.5", for Element Insulator	2
Hardware kit for U-Bolts (Nuts, Lock Washers, Flat Washers)	4
Studded Band Clamp, 2", with hardware (for Feedpoint Connection)	1
Element Clamp, Stainless Steel, for 1-1/2" antenna element	1
Element Clamp, Stainless Steel, for 1-5/8" and 1-3/4" antenna elements	2
Element Clamp, Stainless Steel, for 1-7/8" and 2" antenna elements	2
Stainless Steel Saddle for 2" V Bolts, for customer supplied mounting pipe	2
V-Bolt for 1 to 2" OD customer supplied mounting pipe	2
Black Vinyl Cap, for top of 1-3/8" OD antenna element	1
Aluminum Element - 1.375" OD x 72" x .058" Wall (split one end)	1
Aluminum Element - 1.500" OD x 72" x .058" Wall (split one end)	1
Aluminum Element - 1.625" OD x 72" x .058" Wall (split one end)	1
Aluminum Element - 1.750" OD x 72" x .058" Wall (split one end)	1
Aluminum Element - 1.875" OD x 72" x .058" Wall (split one end)	1
Aluminum Element - 2.000" OD x 72" x .058" Wall (split one end)	1

WARNING!

INSTALLATION OF ANY ANTENNA NEAR POWER LINES IS DANGEROUS



Warning: Do not locate the antenna near overhead power lines or other electric light or power circuits, or where it can come into contact with such circuits. When installing the antenna, take extreme care not to come into contact with such circuits, because they may cause serious injury or death.

Overhead Power Line Safety

Before you begin working, check carefully for overhead power lines in the area you will be working. Don't assume that wires are telephone or cable lines: check with your electric utility for advice. Although overhead power lines may appear to be insulated, often these coverings are intended only to protect metal wires from weather conditions and may not protect you from electric shock

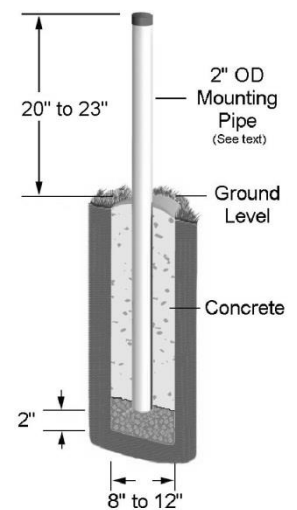
Keep your distance! Remember the 10-foot rule: When carrying and using ladders and other long tools, keep them at least 10 feet away from all overhead lines - including any lines from the power pole to your home.

Installation

Mounting Pipe

Use a customer supplied thick-walled galvanized steel mounting pipe *at least* 4 feet long. This will allow approximately 2 feet or more to be below ground and approximately 2 feet above ground. A thick-walled steel pipe 1-3/4" OD to 2" OD maximum is recommended with a minimum thickness of 1/8" (1/4" preferred) should be used. For permanent mounting, use a post-hole digger to make the hole deep enough to accommodate 2 feet of pipe and a couple inches of gravel at the bottom for drainage. Set the pipe on the gravel, use the pre-mix concrete to fill around the pipe, adding water and mixing as you fill or mix the concrete first, then pour in the hole. Fill the hole until the concrete is level with the ground around it. Use a level as you fill the hole to be sure the pipe is straight. Allow to set overnight. Your location, landscape and ground conditions may require different mounting solutions in order to have the steel mounting pipe and the vertical antenna in a secure position.

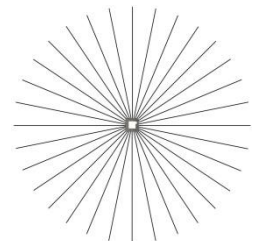
Note: Galvanized steel, rather than aluminum, is much more suitable for mounting in concrete. Aluminum will quickly corrode due to incompatibility with the materials used to make concrete.



Radial System

The use of a radial system is a key requirement for a high performance quarter wave vertical antenna system. With a vertical antenna system, the radials are the second half of the antenna. The radials contribute to the radiation efficiency of the entire vertical antenna system.

For a ground mounted quarter-wave vertical, a minimum of 20 radials, each 32 feet long, should be used. Using 32 radials at 32 feet long is preferred and highly recommended. The extra radials will help overcome unknown poor-soil conditions, improve efficiency, and ensure the best performance possible from the vertical antenna. Improved performance will be achieved if you install 60 radials. DX Engineering **DXE-RADW** Radial Wire, a stranded 14 gauge relaxed PVC insulated copper wire is suggested for the best results. If all radials cannot be 32 feet in length, they should be as long as the installation area allows. A ground mounted HF antenna should be installed at least 20 feet from any obstructions, so all radials should be at least 20 feet long to fit in the available space.



The wire radials should be placed as symmetrically as possible around the vertical antenna and spaced evenly, regardless of how many radials are used. Do not cross or bunch any radial wires as this nullifies their effectiveness. If you have limited space, put in as many straight radials as you can. The radial wires can be attached to the vertical using the lower left V-Bolt Saddle nut. Connect the shield of your feedline to the same V-bolt so your feedline shield is connected to the same point as the radials. The DX Engineering **DXE-RADP-3** Stainless Steel Radial Plate is an ideal optional item which provides an excellent system for attaching radial wires to your vertical antenna system.

If an elevated mount is used, the use of four or more quarter-wave resonant radials must be attached near the feedpoint and arranged in all directions away from the antenna.

Note: Jet-Lube SS-30 (JTL-12555) should be used between all antenna element sections. Jet Lube SS-30 is an electrical joint compound to affect a substantial electrical connection between metal parts such as telescoping aluminum tubing or other antenna pieces. It ensures high conductivity at all voltage levels by displacing moisture and preventing corrosion or oxidation. Jet-Lube should also be used on all clamps, bolts and stainless steel threaded hardware to prevent galling and to ensure proper tightening.

Assembly

1. Slide the two EXTREN[®] element insulators over the bottom of the 2" OD x 72" aluminum element (the slit in this 2" OD aluminum element goes toward the top of the antenna).

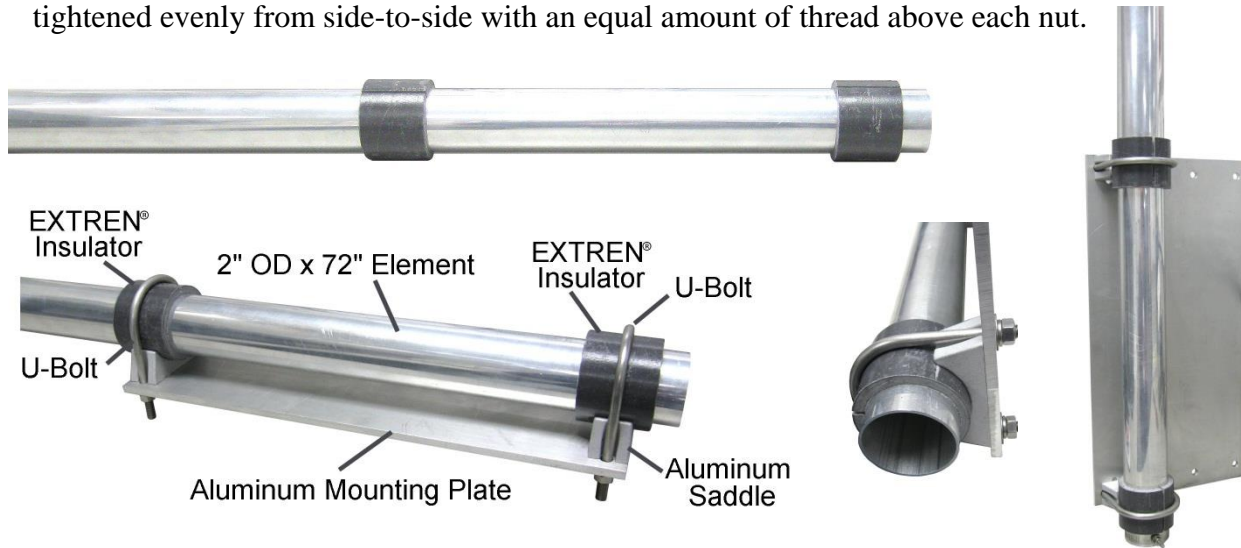
The distance from the bottom insulator to the end of the 2" OD element should be 3/4" to allow room for the feedpoint which is mounted in a later step. The distance between EXTREN[®] element insulators is 8-7/8".



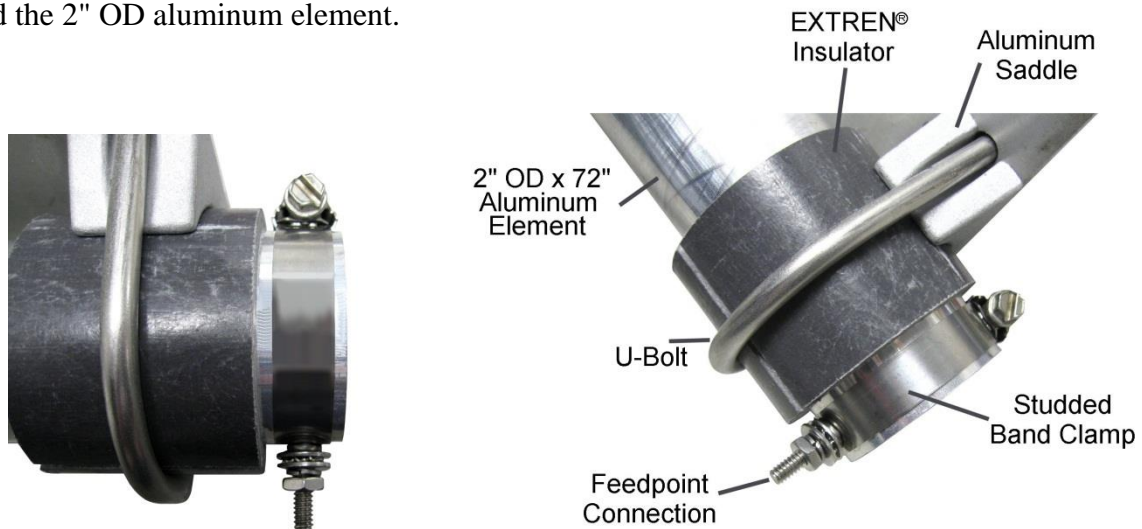
2. Assemble the Saddle Clamps loosely (on the pre-drilled aluminum plate) using the flat washers, lock washers, nuts and U-Bolts as shown below.



- Slide the 2" OD element that has the EXTREN[®] insulators installed in the U-Bolts as shown below. Adjust the EXTREN[®] insulators so they are centered on the U-Bolts. Tighten the U-Bolts evenly so the length of the exposed threads is approximately equal. Any U-Bolt should be tightened evenly from side-to-side with an equal amount of thread above each nut.



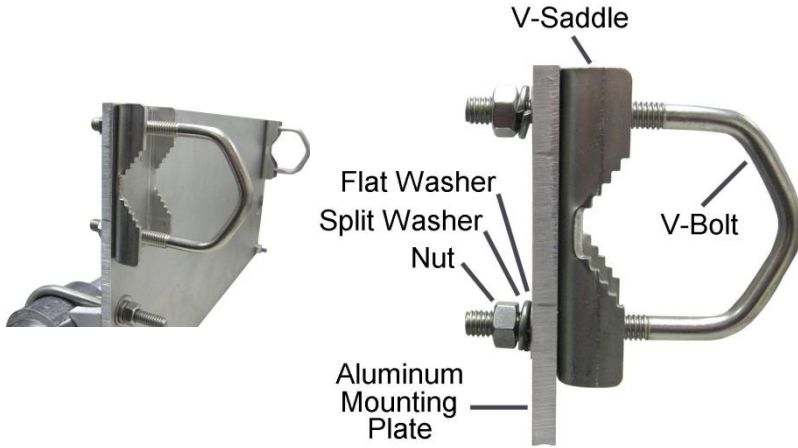
- Install the studded band clamp (antenna feedpoint) at the bottom of the 2" OD aluminum element as shown below. Use a small amount of Penetrox A between the studded band clamp and the 2" OD aluminum element.



- Assemble the vertical sections as shown in **Figure 1** using the stainless steel element clamps allowing a four inch overlap between the element sections. Slide all the clamps over each section before putting them together. You can lightly tighten the clamps just below the slits in each section to hold them until needed. Align the clamp screws on each section to face the same direction. At final assembly, body of the clamp should be positioned between the slits in the tubes and 1/8" from the edge of each tube as shown to the right. The five top element sections have an overlap of 4" to give you a starting overall length of 412 inches. During tuning, you will make slight adjustments to get the center frequency to where you want it.



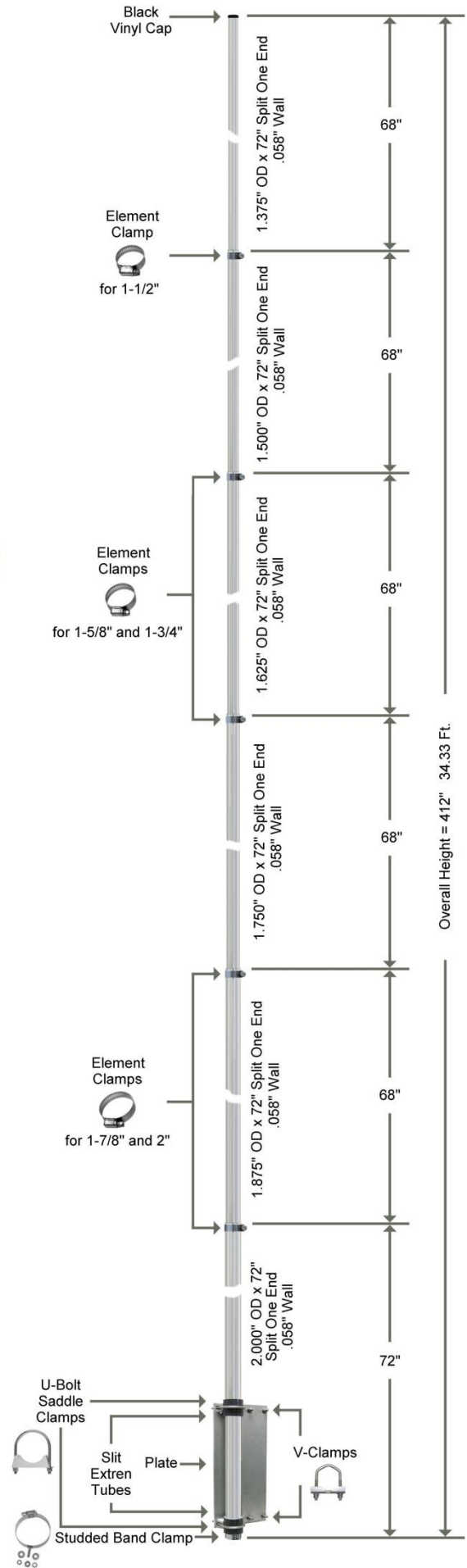
- Install the Black Vinyl Cap on the top element.
- The two stainless steel V-Bolt Clamps are used to secure the mounting plate to the customer supplied mounting pipe described earlier in this manual. When the antenna is installed on the mounting pipe, tighten the V-Bolts evenly so the length of the exposed threads is approximately equal. Any V-Bolt should be tightened evenly from side-to-side with an equal amount of thread above each nut.



- Connect the center conductor of your coaxial feedline to the studded band clamp. The shield from your coaxial feedline must connect to the base plate where you connect your radial wires.

Frequency MHz	Approximate Overall Length
7.000	34 Feet 5 inches
7.125	32 Feet 10 inches
7.175	32 Feet 7 inches
7.300	32 Feet 3 inches

Figure 1
COMTEK 40 Meter
Vertical Antenna
Assembled Diagram



Tuning

Tuning the **COM-40VA** 40 Meter Vertical Antenna is straightforward and intuitive. If you use an SWR meter or an analyzer at the base of the antenna you will get the most accurate readings in a timely fashion.

Since the 2:1 SWR bandwidth of the antenna is wide the adjustment parameters are relatively broad and fine adjustment is not usually necessary.

Note: For the purposes of these instructions the term “resonance” or “resonant frequency” is defined as the point of lowest SWR and may be used interchangeably.

To adjust the low SWR point in the 40 meter band, merely adjust the length of the top tubing section in the normal manner, i.e., making it longer lowers the 40 meter resonant frequency and shortening it raises the frequency. The top element section is made moveable by loosening the element clamp and then sliding the upper element section of the antenna either closer to the base of the antenna or farther away depending on whether you want to lower or raise the frequency of resonance. Be sure to tighten the clamp after making an antenna length adjustment.

Frequency MHz	Approximate Overall Length
7.000	34 Feet 5 inches
7.125	32 Feet 10 inches
7.175	32 Feet 7 inches
7.300	32 Feet 3 inches

The approximate lengths shown in this table should also be used when making resonant radials for an elevated mount antenna (feedpoint is 3 feet or higher from ground level). For ground mounted antennas, resonant radials are not required.

Thank you again for purchasing a Comtek Systems **COM-40VA** 40 Meter Vertical Antenna. .

Enjoy your 40 Meter performance while contesting and DXing.

73,

Comtek Systems www.comteksystems.com

Manual Updates

Every effort is made to supply the latest manual revision with each product. Occasionally a manual will be updated between the time your Comtek product is shipped and when you receive it. Please check the DX Engineering web site - Comtek product line - at (www.comteksystems.com) for the latest revision manual.

Technical Support

If you have questions about this product, or if you experience difficulties during the installation, contact Comtek Systems at (330) 572-3200. You can also e-mail us at:

Info@comteksystems.com

For best service, please take a few minutes to review this manual before you call.

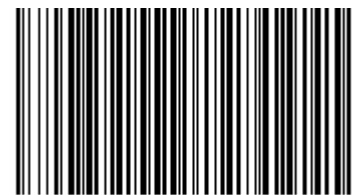
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