LDG ELECTRONICS

Model S9v31

31’ Multiband Vertical Antenna

Installation Guide

WARNING: INSTALLATION OF THIS PRODUCT NEAR POWERLINES IS DANGEROUS. FOR YOUR SAFETY, FOLLOW THE INSTALLATION DIRECTIONS.

INTRODUCTION

Thank you for purchasing the S9v31 31' Mk II multiband vertical antenna, hereinafter referred to as the S9v31. We believe the S9v31 to be the lightest, most efficient and safest full-size vertical antenna available and we sincerely hope that you enjoy your new S9v31.

The S9v31 is a tapered, ultra-lightweight 31' fiberglass vertical antenna designed for fixed and portable Amateur Radio use from 40 through 6 meters. Friction-locking sections and high-tech polymer tube rings allow the antenna to be quickly and safely deployed in practically any environment without tools.

Please read this guide in its entirety FIRST before installing your S9v31. The S9v31 is extremely easy to install and deploy, but reading through this guide first will make it a painless and enjoyable experience.

BEFORE YOU GET STARTED…

The S9v31 is shipped assembled with all the components and hardware you need to install the antenna. You will need to furnish coax cable, an antenna tuner, a balun/unun, a pipe or mast for the ground or elevated mount, some radials, and weatherproofing material.

Coax Cable

For top performance, the antenna should be fed with a high quality, low-loss 50 Ohm coaxial feed line such as RG-213 or LMR 400. Less expensive coax such as RG-8x is also perfectly adequate for short coax runs of 75 feet or less.

Antenna Tuner

Since the S9v31 is extremely close to ¼-wavelength on 40 meters, it can be used as a serious 40 meter monoband DX antenna using the antenna tuner inside your rig (or with an external antenna tuner).

Using a weatherproofed remote antenna tuner at the antenna feed point ensures absolute lowest signal loss and best overall multi-band performance. When a remote tuner is used at the antenna feedpoint, a 4:1 unun is typically not required. However, a 1:1 current choke balun may be needed between the remote tuner and your transmitter if you experience RF current in your shack. (Burying your coax cable also helps minimize RF current from flowing back into your shack.)

Balun/Unun

For 40 meter monoband use, a 1:1 choke balun should be inserted in-line with your coax outside of the radial field to prevent RF from coming back into your shack over the coax shield. Use the LDG RBA-1:1 for up to 200 watts or a unit from Balun Designs for more than 200 watts.

For Multiband use, a 4:1 "Unun" is recommended at the antenna feed point (unless you are using a remote antenna tuner). A 4:1 unun helps match the high impedance presented by the antenna on some frequencies to your coax feed line. If using 200 watts or less, you can use the LDG RU-4:1 Unun. This unun has been rigorously tested with the S9v43 and offers excellent performance. For more RF power check out the Ununs from Balun Systems.

Ground or Elevated Mount

For standard ground-mount installations, use a 40-inch long (minimum recommended length), 1-1/4" ID galvanized pipe (1.66" OD). Hardware stores such as Home Depot™ and Lowes™ stock 1-1/4" ID galvanized pipe in their plumbing departments and this type of pipe is ideal for the ground mount. Most hardware stores also have a pipe cutting machine and they will cut your pipe to 40 inches upon request.

The S9v31 base tube simply slips over the 1-1/4" ID pipe and rests on the ground for an easy and elegant deployment. (A mechanical connection from the antenna base tube to the ground mount is neither required nor desired. A 1-1/4" ID pipe clamp (not included), lets you raise the S9v31 base off of the ground for a professional installation.

For elevated installations, mount the antenna on a mast. To create a mount for the S9v31 on the mast, simply install a 1-1/4" ID pipe clamp 15" from the top of the mast. The S9v31 will slip over the mast and rest on the flat portion of the clamp assembly. In this elevated configuration, the S9v31 functions as a ground plane (GP) antenna and four radials are required for each intended band of operation.

Radials

Ground-mounted radials, use at least 16 radials (32 preferred), with each radial at least 0.2 wavelength at the lowest operating frequency (7 MHz) which is 26.75 feet (26 feet, 9 inches long). A ground rod is not an effective RF ground. 14 – 16 AWG stranded insulated copper wire is recommended. There is no precise formula to calculate the length of ground-mounted radials because everyone has different soil and soil tends to change the electrical length of the radials. However, a general rule of thumb for radials is: "as many as possible" and "some are better than none". Also, multiple short radials are better than a few long radials. If you have the time and resources, 32 or more radials at least 26 feet, 9 inches in length (or longer) should be considered.

It is highly recommend that you use ring terminal connectors and a radial plate to connect and organize your radials. The optional LDG S9RP Radial Plate has 36 radial mounting holes and includes 20 sets of stainless steel hardware – enough to connect 40 radials to the plate.

LDG S9RP Radial Plate

Elevated installation Radials, use four, ¼ wavelength radials for each intended band of operation. For example, you should have four ¼-wavelength radials for 40 meters, four ¼-wavelength radials for 20 meters, and so on. Attach the radials to the optional S9v31 Pipe Mount Clamp below the base of the antenna and try to position the radials equidistantly around the S9v31 base. The radials may lie flat or droop up to a 45-degree angle down from the base of the antenna. Attach insulators to the ends of the radials. Connect your coax shield to the clamp and radials. Do NOT run a wire from the radials/clamp/coax shield to an earth ground.

S9v31COMPONENTS

The S9v31 consists of 10 lightweight telescoping tapered fiberglass tubes with a continuous, insulated vertical element wire inside the tubes. The base tube functions as a hard shell case, protecting the collapsed fiberglass sections. The antenna is shipped with end caps and polymer tube rings to retain the telescoping sections and to facilitate portable operation.

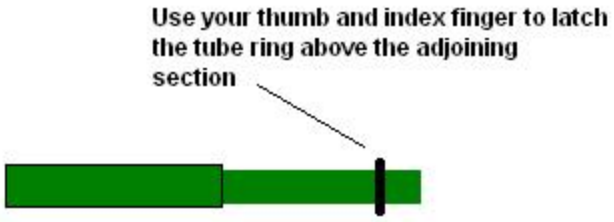
S9v31– HARDWARE

Eight Polymer Tube Rings

ABOUT THE TUBE RINGS…

- **The polymer tube rings are not clamps – they are "stops" that are used to keep the associated tube section from collapsing down into the tube immediately below it.**

- **Slide a tube ring over the tube and use your thumb and index finger to loosely latch the ring about 15 to 20 inches above the adjoining, lower tube.**



- **Next, slide the ring down the tube to see if it fits tightly against the top edge of the adjoining lower tube.**

- **If the ring is not tight, slide the ring back up the tube, use your thumb and index finger to advance the latch ONE MORE CLICK. Repeat the previous step and this step until the ring fits tightly against the top edge of the lower tube section as shown above.**

- **Once a tube ring is properly latched, there is no need to unlatch or change the ring latch setting – simply slide the rings on and off the tubes each time you assemble or disassemble the antenna.**

Unlatching a tube ring is easy! Use both hands. Push forward on one tab while pulling back on the other tab to free the latching mechanism, as shown below.

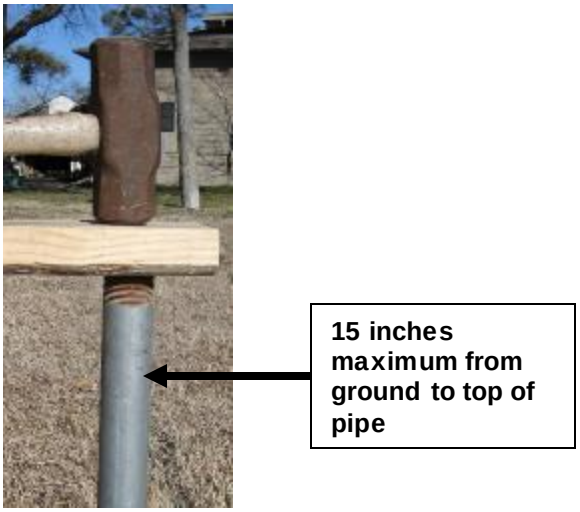
INSTALLATION – DETAILED INSTRUCTIONS

1. **Select the Site**. Try to use a clear and open area to deploy the S9v31. Even though the S9v31 is completely insulated, you absolutely MUST locate the antenna site at least 46' away from power lines (1.5 times the length of the antenna). In fact, an ideal installation site would be a least 46' away from *any* other large object such as a house or trees.

2. **Install the Mount**. The S9v31 requires a mount. The elevated mount was discussed earlier. For ground-mount installations, you will need a large hammer, a spare piece of wood and a level.

IMPORTANT!

Place a piece of wood over the top of the pipe or Portable Mount to protect the top edges from becoming deformed. Hammer the piece of wood in a straight downward direction. Do NOT directly hammer the pipe or Portable Mount metal – hammer the wood to protect the pipe/mount.



NOTE: Use a level while you are installing the pipe or Portable Mount to ensure that it is as straight as possible in the vertical plane.

Drive the 1-1/4 ID" x 40-inch long pipe into the ground leaving 15 INCHES MAXIMUM above the ground. Mount the 1-1/4" ID pipe clamp on the pipe an inch or two above the ground.

3. **Install the Radial Plate**. After you have installed the pipe, install the radial plate. (The S9 Radial Plate simply slips over the pipe or Portable Mount and rests on the ground.)

4. **Assemble the S9v31**.

a. Lay the S9v31 on the ground near the ground mount and unwind the vertical element wire from the base tube. Now, "walk the wire" away from the antenna base tube in a straight line. Don't pull unnecessarily on the wire – the idea is to just un-roll the wire to its full length. Once the wire is completely unrolled, pull small sections of the wire through your hands to straighten the wire.

NOTE: The wire does NOT have to be perfectly straight, so don't spend a lot of time trying to straighten the wire!

Pull wire straight out from base tube until it is fully extended along the ground

b. Next remove the TOP rubber plug. Do NOT remove the BOTTOM plastic end cap where the wire exits. Put the top rubber plug in your pocket so that it will not be lost in the grass.

c. Now we are ready to extend the antenna sections. The S9v31 should still be laying flat on the ground. To extend the antenna, grab a section of the wire near the bottom end cap and push the wire into the base tube. This action should cause the top, thinnest section of the antenna (it has a cap on its tip) to pop out of the top of the base tube. (If this doesn't work, pick-up the base tube and shake it slightly while pointing the top part of the tube downward.)

Grab top section here (not the cap) and pull straight out to retrieve the next section. Repeat until all sections are extended from the base tube.

d. Gently pull the top, thinnest section straight out of the base tube (pull the section, not the cap) until it catches and pulls the next, lower section out. Gently twist the top section to lock it into the lower section. Now, pull the lower section straight out until the next section appears. Repeat this until you have extended all the sections from the base tube. Pull and twist the sections to friction-lock them but **don't overdo it as it may be difficult to collapse the sections later on if they are over-extended**.

e. As shown below, each upper tube section (except the top, tip section) requires a polymer tube ring to prevent the tube from collapsing down into the larger diameter tube immediately below it.

f. To install a ring, slide it over the top of each upper section and use your thumb and index finger to squeeze the ring tabs until the teeth click together, as shown below.

g. Next, slide the ring down the tube toward the lower, larger tube section. All tube diameters are tapered, so the goal is to have the ring fit tightly against the top of the adjoining lower tube section. You may have to slide the ring

back up the tube (where the diameter is smaller) to advance the ring latch another click and then slide the ring back down the tube before you find the perfect fit. No pliers or tools are needed! This process is easily done by hand. Use common sense to determine when a ring is tight enough to keep the associated tube from collapsing.

NOTE: Unlatching a tube ring is easy! Use both hands. Push forward on one ring tab while pulling back on the other tab to free the latching mechanism.

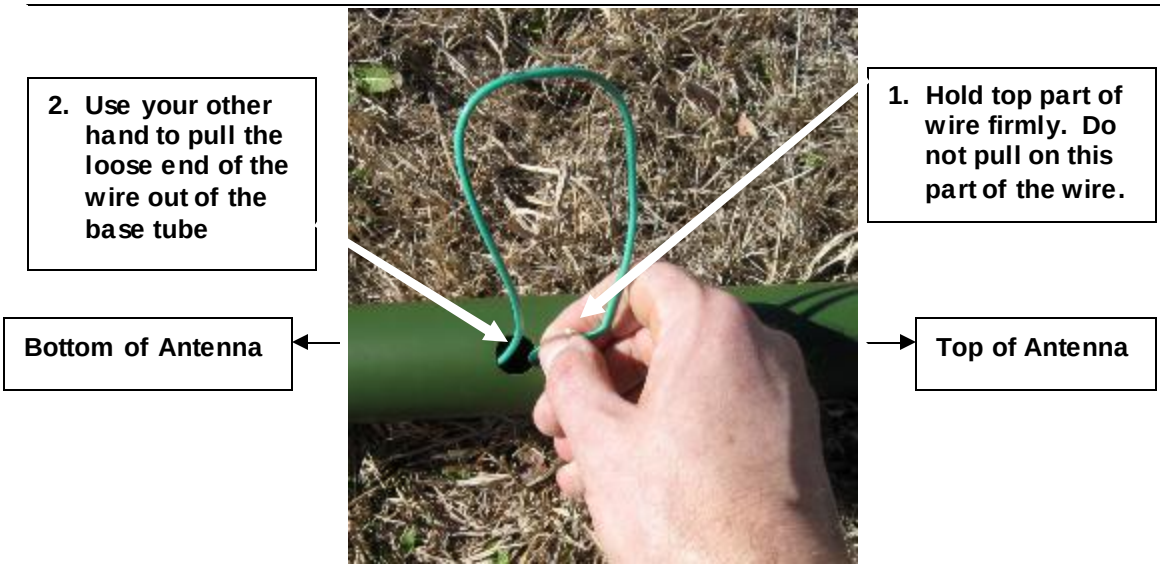
h. The top tip section does not require a tube ring. To secure the top section, hold the section below it with one hand and firmly twist and pull the tip section with your other hand until it is firmly friction-locked in place.

NOTE: The antenna should now be fully extended and laying on the ground and all sections (except the top section) should have the tube rings installed.

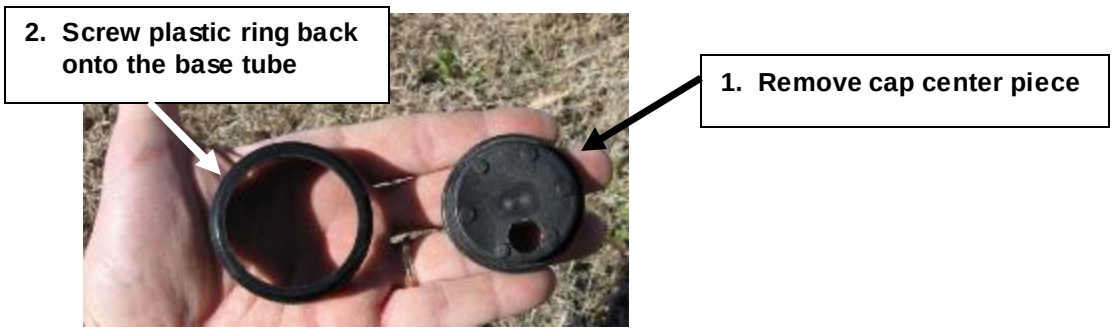
i. Now, let's retrieve the vertical element wire from the base tube. Rotate the base tube until you see the wire exit hole.

j. Use needle nodes pliers, tweezers or a dental tool to grab the wire and pull a small U-shaped portion of the wire through the exit hole, as shown below.

Next, hold the top part of the wire firmly in one hand while you use your other hand to pull the lower, loose end of the wire out through the hole. Do not pull on the top part of the wire – just pull on the lower, loose end!



k. Before we raise the antenna, unscrew the bottom end cap. This cap consists of a center piece and plastic ring. Remove the center piece and put it in your pocket. Now screw the ring back onto the bottom of the base tube. The ring will protect the base tube bottom cap threads while the antenna is deployed and it also creates a drain path for any moisture that accumulates inside the fiberglass sections.



5. **Raise the S9v31**. This is the fun part! To raise the S9v31, simply grab the base tube with one hand and the next section with your other hand and raise the antenna. Next, center the antenna directly over the pipe or Portable Mount and then gently lower the S9v31 down until the bottom of the base tube rests on the ground or the optional pipe mount clamp.

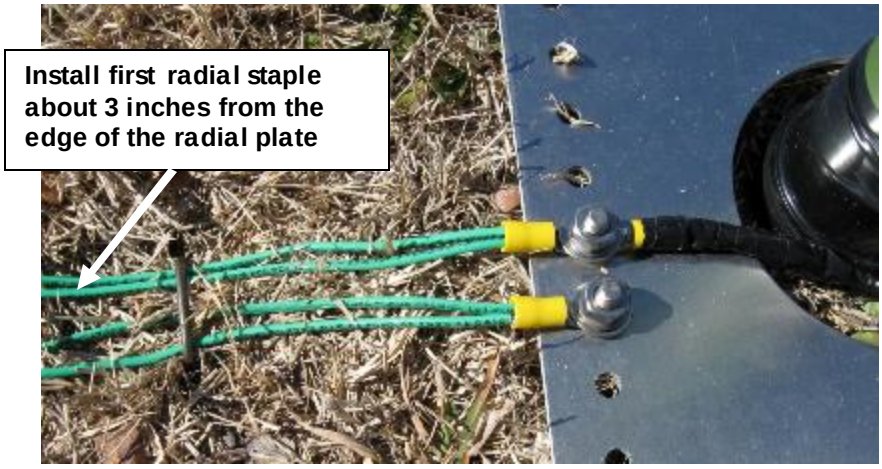
6. **Connect Balun or Unun to Antenna**.

If you are using the S9v31 as a 40 meter monoband vertical, connect a 1:1 current balun to the antenna wire and ground plane. Use good quality coax to go to your ham shack.

If you are using the S9v31 as a multi-band antenna (40 – 6 meters), use a 4:1 Unun and connect to the antenna wire and ground plane. Use good quality coax to go to your ham shack.

7. **Install Ground Radials**. For ground-mount installations, we suggest a minimum of 16 radials, each at least 26 feet, 9 inches long spaced as evenly as possible around the S9v31 base – like wheel spokes. For best performance, use 32 (or more) radials. It is suggested that you use 14 – 16 AWG insulated stranded copper wire (available at Home Depot™ and sold in 500-ft rolls for around $35).

   Use lawn and garden fabric staples (sold at Home Depot™ or Lowes™) to secure the radials to your yard. Install the first staple about 3 inches or so from the edge of the radial plate. Grass will eventually grow over the radials and cover them. In the meantime, be sure to set your lawn mower blade a little higher than normal to ensure that the radials do not get caught in the mower blade - this advice comes from real-world "experience" (!). It is best to use *at least* 8 staples per radial to ensure the radials are held firmly against the ground.



LOWERING THE S9v31

The antenna should perform in winds up to around 40 MPH. Ice is definitely a concern for any antenna. If winds above 40 MPH and/or ice are expected, you should lower the antenna to protect it from becoming damaged.

To lower the S9v31, simply disconnect the vertical element wire from the coax center connection (or unun/remote antenna tuner) and carefully lift the antenna straight up off of the ground mount pipe. Then, gently lower the antenna to the ground.

NOTE: If the wind is strong, it is easier to lower the antenna with the wind at your back.

If your S9v31 becomes damaged, replacement fiberglass sections are available from LDG at reasonable cost.

DISASSEMBLING THE S9v31

To disassemble the S9v31:

1. Disconnect the vertical element wire from the coax center connection or unun.

2. Carefully lift the antenna off of the ground mount and gently lower it to the ground.

3. Remove the black plastic end cap ring from the base tube and insert the rubber center piece back into the ring – we will put this cap back on in a few steps, so hold onto it for now.

4. Carefully bend and push the connector end of the vertical element wire back through the exit hole and into the base tube.

5. Slide ALL tube rings off of the fiberglass sections and put them in a zip lock bag for future use.

6. Now, collapse the antenna sections. Hold the base tube firmly in one hand and grab and twist the section above the base tube while pushing it toward the base tube until the tube collapses into the base tube.

7. Before collapsing any other sections, pull the vertical element wire out of the bottom of the base tube.

8. Thread the wire through the small hole in the end cap center piece and then screw the bottom end cap back onto the base tube.

9. Stay at the base tube and collapse the remaining antenna sections one-by-one by twisting and pushing them into the base tube.

   NOTE: Be sure to keep an eye on the vertical element wire to ensure that it does not get caught in any of the collapsing sections.

10. When all of the sections are in the base tube, push the rubber end cap into the top of the base tube.

MAINTENANCE

The S9v31 features an enhanced, durable painted surface. If you notice surface oxidation (color becomes lighter), use a soft cloth and Armor All™ to restore the finish. Automotive spray wax is also an excellent product to seal and protect the finish. The S9v31 may also be repainted, if desired, using a quality exterior spray paint such as Krylon™ or Rustoleum™. It is suggested that you lightly dull the finish and then prime it with a quality primer before you paint it.

SUPPORT

If you have any questions or problems installing your S9v31, please contact us.

You can reach us via:
Email - support@ldgelectronics.com
Phone - 410-586-2177
Web – www.ldgelectronics.com

Our mailing address is:

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