

JK-401

40M Hi-Q Coil Loaded Rotatable Dipole



PO Box 266, Croton Falls, NY 10519-0266
845.228.8700 (TEL) • 845.279.5526 (FAX) • info@jkantennas.com

LAST UPDATED: 5-21-2015

JK Antennas Limited Warranty and Liability

JK Antennas ("Manufacturer") warrants to the original purchaser that this product will be free from defects in material, and workmanship for a period of one (1) year from the date of purchase. The determination of whether any part or parts will be covered by this limited warranty and whether any part or parts will be repaired, replaced or refunded will be solely determined by JK Antennas. Such determination will be made following evaluation of claim of alleged defect and subject to evaluation of possible misuse, abuse, unauthorized modifications, extreme weather conditions or improper installation. This warranty does not cover delivery, transportation, installation or any other costs that may be incurred from any defect.

The purchaser, final customer, installer and user of these products individually and collectively acknowledge that these products can cause injury or death and individually and collectively accept full responsibility and liability for any and all personal and property damage (direct, indirect and punitive) caused during installation and subsequent use.

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WARNINGS

- **Installation of this antenna near power lines is dangerous. Contact with any high voltage power lines could result in electric shock or loss of life. Do not install this antenna where there is any possibility that the antenna or any part of the supporting structure could come in contact with power lines.**
- **Also ensure that no persons or pets can come in any contact with the antenna after it is installed. Dangerous voltages can exist on the antenna when it is in operation and no part of the system is insulated to prevent shock.**
- **Consult with FCC OET Bulletin 65 to properly evaluate whether the chosen installation site for this antenna will comply with the FCC guidelines for human exposure limits to radio frequency electro-magnetic fields.**
- **This antenna structure is not designed to be used as a support structure. No persons or objects should be supported by or suspended from the antenna structure at any time.**
- **Because most antenna systems are installed at high heights, the installed location must take into account that falling debris may pose a hazard to humans, animals and property on the ground below.**
- **Be aware of and follow all local codes and ordinances when installing this antenna.**

TOOLS REQUIRED

This antenna uses all **SAE standard tool sizes**. Metric fasteners are *not* used on this antenna. Ensure hex keys used are **SAE** sizes to avoid stripping the socket cap screw heads.

Size	Description
5/16"	Nut driver, socket or wrench (for #6-32 nylon lock nuts)
11/32"	Nut driver, socket or wrench (for #8-32 nylon lock nuts)
3/8"	Nut driver, socket or wrench (for #10-24 nylon lock nuts)
7/16"	Nut driver, socket or wrench (for 1/4-20 nylon lock nuts)
9/16"	Nut driver, socket or wrench (for 5/16-18 nylon lock nuts)
7/64"	Allen wrench / Hex Key (for 6-32 socket head screws)
9/64"	Allen wrench / Hex Key (for 8-32 socket head screws)
5/32"	Allen wrench / Hex Key (for 10-24 socket head screws)
3/16"	Allen wrench / Hex Key (for 1/4-20 socket head screws)
9/16"	Socket and ratchet (preferred), or combination wrench, or adjustable wrench (for 3/8-16 Bolts.)

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ASSEMBLY GUIDELINES

1. Open the boxes and lay out the elements, hardware kits and parts
2. Using the parts list at the end this document, check to make sure all tubing, hardware kits and parts are included (extra numbers of bolts, screws, nuts and washers are included)
3. **The use of Penetrox or Noalox or any other Anti-seize/Anti-Oxidant compound is HIGHLY recommended during installation of this antenna. Use a drop or 2 of this anti-seize paste on all screws before fastening. This will prevent the stainless-steel hardware from accidentally locking up. Also a drop or two of the anti-oxidant paste on the element transitions will prevent corrosion in the joints as well ensure long lasting electrical performance.**

The document has been separated into different assembly sections based on the packaged hardware kits. While it is recommended to assemble in the order presented, please adjust as needed based on your working conditions and assembly area.

STEP 1: Mast Plate Assembly

The 1st step is to assemble the small “L” shaped mast plate to the Element Channel. The small **Mast Plate** has 2 holes that will match up with the larger center holes on the topside of the 40M Element Channel. Attach the plate to the channel using the hardware included in the **Mast Plate to Channel Kit**.



STEP 2a: Element Center Section Assembly

The 40M Dipole Element center section is comprised of two (2) 3-ft long aluminum tubes with an outer diameter of 1-3/4", one (1) solid fiberglass rod (1.5"OD), and the hardware found in the **40M Dipole Element Hardware Kit**.



- 1) Slide one end of the fiberglass rod inside the end of one aluminum tube and align the holes.
- 2) Place the shorter screw on the hole away from the center and tighten using a nylon nut.
- 3) Place the longer screw through the hole closer to the center with a serrated lock washer on each side and tighten with a nylon nut.
- 4) Do the same on the other side so that the fiberglass rod has aluminum tubes attached on both sides.

Once assembled, the Element center section can be mounted onto the element channel. *(The above picture shows the Balun "L" straps attached to the dipole element center screws.)*

STEP 2b: 40M Element to Element Channel Assembly

The element center section is attached to the **Element Channel** using two (2) **Black Polyamide Clamps** and the hardware from the **Element to Element Channel Kit**. When mounted on the mast, the open section of the channel will face down (toward the ground) so that the black clamps are visible.

Before applying final torque to the black clamps, there are several alignments that must be completed:

- 1) Align the element center section tube exactly in the center of the element channel.
- 2) Align the tube so that when screws are used to attach the next taper, the screw heads will face up (towards the sky).
- 3) When mounting the center section, make sure that the exposed screws in the center face away from the Element Channel (down, towards the ground).
- 4) **Optional & Recommended** : Twist the center section to point the screws at 45-degrees. This will enable the balun to be mounted as shown in the picture under the balun assembly detailed on Page 12 in STEP 3.

After the above alignments are completed, tighten the screws on the black clamps evenly, alternating between each bolt. Do not apply all the torque to one bolt at a time, as this raises the chances of galling occurring when the opposite bolt is tightened. The gap between the blocks should just close when the torque is correct, and there should be an even amount of thread sticking out above each nut. **Do NOT continue to add additional torque after the gap closes.**

CAUTION: Continuous over-tightening can cause the screw-head to jam through the black clamps holes.



40M center sections mounted on element channels

STEP 2c: 40M Coil Assembly

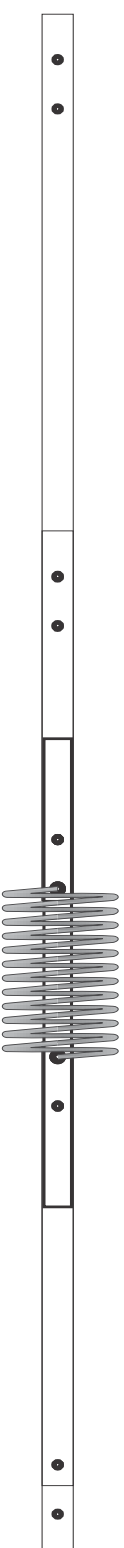
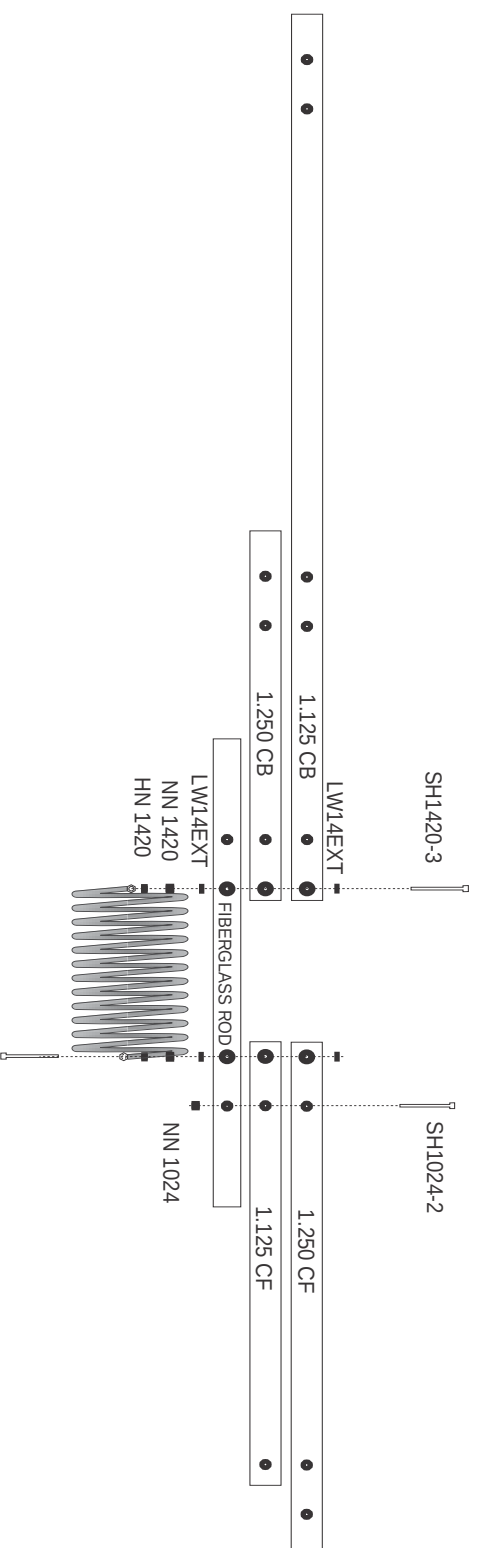
Each 40M coil assembly is comprised of 4 aluminum tubes (two 1.25" OD & two 1.125" OD), one fiberglass rod, one coil, and the appropriate screws, nuts, serrated lock washers and silicone tape (**Coil Hardware Kit**).

Reference: (1.25CF = 21"/4-holes), (1.125CF = 18"/3-holes), (1.25CB = 15"/4-holes), (1.125CB = 36"/6-holes)

- 1) The 1.125" OD aluminum tube slides into the 1.25" OD aluminum tube for double wall thickness.
- 2) Match up the 1.125" CF with the 1.25" CF, and the 1.125" CB with the 1.25" CB during assembly. The 1.125" OD CB tubes are 36" long and the fiberglass rod will have been inserted into one of them during packing.



40 Meters Coil Section Assembly





The fiberglass rod has 4 holes, two of which are 1/4" holes, and two of which are #10. The #10 holes are the outside holes from the center and are used for the mechanical mounting of the tubing to the fiberglass. The 1/4" holes are used for mounting the coil.

NOTE: Always use an anti-oxidant (Penetrox) while tightening the screws and nuts.

- 3) Starting with either the two CF or the two CB tubes (doubled with the holes lined up), insert the fiberglass rod and line-up the holes. Attach the tubes to the rod through the #10 (outside) holes using the provided 10-24 screws and 10-24 nylon nuts.
- 4) Repeat on the other side of the fiberglass rod with the remaining doubled set of tubes. Once completed, the section should look like the picture below, with the 1/4" holes still open.

10-24 holes (outside) to attach fiberglass rod to aluminum tubes



1/4" holes (inside) to mount the coil

Now, to attach the coils, follow these steps:

- 5) Place a serrated/tooth washer (LW14ExT) onto a 1/4"-20 screw, and insert into one of the 1/4" holes on the fiberglass rod/tube assembly.



- 6) Add another serrated/tooth washer onto the screw on the far side of the rod, and finish with a 1/4-20 nylon-nut. Tighten as far as you can, stopping just short enough to still allow the screw to rotate freely.
- 7) Attach a 1/4-20 plain hex nut and turn it until it reaches the nylon nut.



- 8) Follow these same steps with the remaining hole on the other side of the fiberglass rod, but this time insert the screw from the opposite side of the rod.
- 9) Wrap the provided silicone tape over the exposed section of the fiberglass rod (this tape has no adhesive, so it only bonds to itself – stretch and wind the tape over the exposed section, using approximately 24 inches or less of tape on each rod).



- 10) Slide the coil onto the assembly; thread the 10-24 screw four to five times directly into the coil standoff.



- 11) GENTLY tighten the hex-nut over the standoff to act as a jam nut.
- 12) Do the same on the other side.
- 13) Tighten the nylon-nut firm and tight along the tube.

NOTE: It is very important to have a solid mechanical connection, with the nut and screw making a tight contact over the tubing. Visually inspect the coil assembly for any twists or non-symmetry while tightening these nuts. Adjust them carefully by pulling them back into place. Repeat this same process for all the coil assemblies.



The total assembled length of the “coil assembly” is approximately 62-5/8”.

NOTE: While tightening, take care to **NOT** put too much pressure over the coil standoffs. We recommend that you hold the standoff with pliers or a wrench to prevent any excess pressure being put on the coil joint to the standoff while tightening the jam-nut.



STEP 2e: Element Taper Assembly

Once the 40M center section has been mounted, and the coil sections have been assembled, the remaining tubes can be sleeved in to complete the tapered element sections.

40M: The 40M element has eight (9) tapered aluminum sections on each side of the 1.75" center section, ranging from 1.5" (largest) to .375" (smallest).

- 1) Slide 6 inches of the 1.5" OD tube into the center section tube and align the holes. Attach using the appropriate hardware (**40M Element Hardware Kit**) as shown in the table below. (Use a drop of anti-seize paste on all screws).

Transition	Screw Size	Nylon Nut Size
1.75" – 1.5"	SH1024-4	NN1024
1.5" – 1.25"	SH1024-3	NN1024
1.25" - 1.125"	SH1024-2	NN1024
1.125" - 1"	SH1024-1	NN1024
1" - .875"	SH832-4	NN832
.875" - .75"	SH832-3	NN832
.75" - .625"	SH832-2	NN832
.625" - .5 Slit"	SH832-1	NN832
.5" Slit - .375"	HC-2	none

- 2) Slide the CF side of the 40M coil assembly (1.25" tube) into the 1.5" OD tube and attach.

Important : The 1.0"OD tubing has 2 different hole diameters at each end. The larger hole side goes into the 1-1/8" tubing and the smaller hole side towards the 0.875"OD tubing.

- 3) Continue to assemble and attach the progressively smaller tapers of aluminum tubing, using the appropriate hardware, as shown in the table above.

<i>Exposed Length</i>	<i>36"</i>	<i>30"</i>	<i>15"+15"</i>	<i>21"</i>	<i>30"</i>	<i>30"</i>	<i>30"</i>	<i>30"</i>	<i>30"</i>		Tip Length
Tubing OD	1.75"	1.5"	1.25"	1.125"	1"	.875"	.75"	.625"	.5" Slit	.375" is the tip	15"

The tips lengths have been optimized for 7.120 +or- performance.

- 4) The smallest taper on each element is inserted into the slit end of the previous size, and attached using a hose-clamp (and not the screws). The exposed tip length of the smallest taper on each element must follow the table above.

NOTE: Always use an anti-oxidant (Penetrox) while tightening the screws and nuts.

We recommend assembled elements to have the screw head on the top side of the element (facing the sky) and the nut on the bottom side of the element (facing the ground).

NOTE: Always use an anti-oxidant (Penetrox) while tightening the screws and nuts.

STEP 3: Balun Assembly

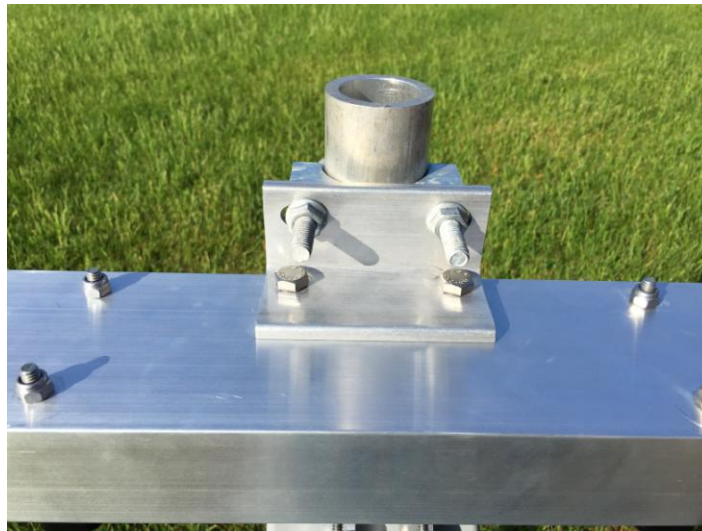
- 1) Insert serrated lock washers (LW10ExT) from the **40M Dipole Element Hardware Kit** onto the longer center exposed screws of the Dipole Element.



- 2) Next, mount the balun “L” leads onto the exposed screws
- 3) Insert another serrated lock washer on each screw
- 4) Insert the plain hex nut (HN1024) and tighten, but be careful NOT to over-tighten
- 5) Insert and screw another plain hex nut, which will act as a lock
- 6) Insert the balun on the other side of the “L” leads, mount and tighten
- 7) Attach the coax to the balun and tape the coax to the Mast.

STEP 4: Mounting Dipole on Mast

When assembly is complete, mount the dipole onto the mast using the **Mast to Mast Plate Kit**.



STEP 5: Antenna Final Check and Test - Prior to Installation

Dimensions: Although the element lengths are set from the factory, it is highly recommended that you take the time to document and check *all* the dimensions of your assembled antenna with factory dimensions.

Hardware Installation: Verify that all the hardware has been tightened and there are no loose fasteners.

SWR Test: You may connect a SWR analyzer with the antenna only a few feet off the ground to make sure you do not have a short or open circuit anywhere. You can do this by verifying that you do not have an extremely high SWR on each band. Do not be concerned unless the SWR is high on both bands. The antenna will not have the specified SWR curves unless it is installed at a height of at least 35 feet above ground. With the antenna at least 6 feet from the ground, you will start to see the SWR “dip” below 2:1 somewhere in or near each of supported frequency ranges. As long as you start to see a dip somewhere around (above or below) each of the two bands, you may proceed with installation.

For example in the case of 40M (7.110MHz), the dip will be usually below 7.0MHz and close 6.825 MHz depending on height above ground (6ft approx.)

Installation: The antenna should be installed by a professional in a safe manner on a support structure that is rated to handle the weight and wind load of this antenna, in all expected weather conditions. Pretest the entire run of coax cable with a 50 Ohm “dummy load” to ensure there are no problems with either the coax or the coax connectors. Most SWR issues are due to coax or connector issues and not related to the antenna itself. Even if the coax was previously being used for another antenna, repositioning of the cable can cause new connector faults to occur. You should also test the cable at the full power you intend to run, if possible.

Surrounding metallic objects (other antennas, guy wires, etc.) can affect the performance of the antenna. If the antenna is not interacting with anything, you can expect the specified SWR curve, gain and front to rear performance. There are no user adjustments necessary for this antenna - any SWR issues indicate a coax and/or connector fault, or interaction of this antenna with another metallic object and those situations must be corrected.

The reference SWR curves are available on our website at: <http://jkantennas.com/jk401.html>

JK401 Parts List

MAST TO ELEMENT ASSEMBLIES					
	Mast Plate			Mast to Element Channel Plate	1
	Mast Plate to Element Channel				
	HH3816	1-1/4"		Hex Head Screw 3/8-16	2+1
	NN3816			Plain Hex Nut 3/8-16	2+1
	Mast to Mast Plate				
	U-Bolt	2" ID		3/8" U-Bolt for Mast Mounting	1
	40M Channel Assembly				
	40M Channel-1			40M Element Center Plate	1
	BC1.75			Black Polyamide clamps 1.75" ID	4
	SH1420	3"		Socket Head Screw 1/4"-20 (3")	8+2
	NN1420			Nylon Nut 1/4-20	8+2

40M ELEMENT ASSEMBLIES					
	3AT1.75			3 ft Alum Tube 1.75" OD	2
	3AT1.5			3 ft Alum Tube 1.5" OD	2
	3AT 1.25 CFC			3 ft Alum Tube 1.25" Coil Front	2
	3AT1.25 CBC			3 ft Alum Tube 1.25" Coil Back	2
	3AT1.125 CFC			3 ft Alum Tube 1.125" Coil Front	2
	3AT1.125 CBC			3 ft Alum Tube 1.125" Coil Back	2
	3AT1.0			3 ft Alum Tube 1" OD	2
	3AT.875			3 ft Alum Tube .875 OD	2
	3AT.75			3 ft Alum Tube .75" OD	2
	3AT.625			3 ft Alum Tube .625" OD	2
	3AT.55			3 ft Alum Tube .5" OD (slit end)	2
	3AT.375			3 ft Alum Tube .375" OD	2

Coil Assembly					
	40M Coils			40M Coils	2
	FG1.0 Coil			Fiberglass rod 1" OD	2
	SH1024-2	1-3/4"		Socket Head Screw 10-24	4+1
	NN1024			Nylon Nut 10-24	4+1
	SH1420-3	2-1/4"		Socket Head Screw 1/4"-20	4+1
	NN1420			Nylon Nut 1/4"-20	4+1
	HN1420			Hex Nut 1/4"-20	4+1
	LW14ExT			Lock Washer 1/4" External Tooth	8+2
	Tape			Tape	1

Element Assembly Hardware				
	SH1024-1	1-1/2"	Socket Head Screw 10-24	4+1
	SH1024-2	1-3/4"	Socket Head Screw 10-24	4+1
	SH1024-3	2"	Socket Head Screw 10-24	4+1
	SH1024-4	2-1/4"	Socket Head Screw 10-24	4+1
	NN1024		Nylon Nut 10-24	16+2
	SH832-4	1-1/2"	Socket Head Screw 8-32	4+1
	SH832-3	1-1/4"	Socket Head Screw 8-32	4+1
	SH832-2	1-1/8"	Socket Head Screw 8-32	4+1
	SH832-1	1"	Socket Head Screw 8-32	4+1
	NN832		Nylon Nut 8-32	16+2
	HC-2		Hose Clamp 9/16" Band Width	2+1

40M DRIVEN ELEMENT HARDWARE				
	FG1.5DE		Fiberglass Rod for Driven Element	1
	BH1024-4	2-1/4"	Socket Head Screw 10-24	2+1
	BH1024-6	2-3/4"	Socket Head Screw 10-24	2+1
	NN1024		Nylon Nut 10-24	4+2
	LW10		Flat Washer #10	4+2
	LW10ExT		Lock Washer #10 External Tooth	8+2
	KP10124		Keps Nut 10-24	2+2

SUPPLIES				
	Noalox		Anti-Oxidant	1
	L Straps		Balun Mounting Straps	2