

# **JK-2040 HAWK**

**Five Element 20M / Three Element 40M Yagi**



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## **JK Antennas Limited Warranty and Liability**

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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.

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## **WARNINGS**

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- **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 electromagnetic 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

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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.)

# JK2040 HAWK - 5 Elements on 20M / 3 Elements on 40M / 40 Foot Boom

## ASSEMBLY GUIDELINES

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1. Open the boxes and lay out the elements, hardware kits and parts
2. Using the parts list at the end of 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.**

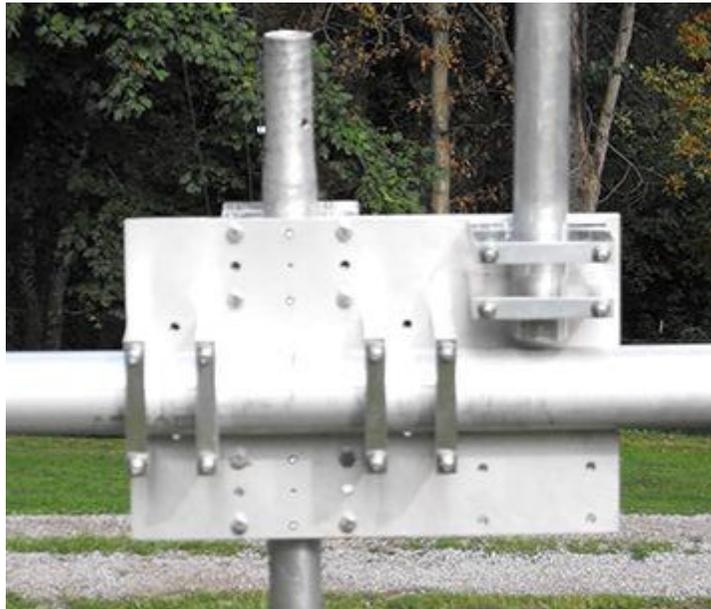
The document has been separated into different assembly sections based on the packaged hardware kits. While it is recommended to assemble in the order presented, please adjust as needed based on your working conditions and assembly area.

### STEP 1: Boom/Mast Plate Assembly

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The JK2040 HAWK comes with one (1) 8-ft boom FRONT end section and one (1) 8-ft boom REAR end section (sleeve assembly holes on one end) and three (3) 8-ft boom center sections (sleeve assembly holes on both ends). The boom sections are connected to each other using an internal sleeve at each boom joint. The boom has a 3" outer diameter.

Gather the **Mast Plate**, the **Boom to Mast Plate Kit** (clamps and hardware), and the **Mast to Mast Plate Kit** (clamps and hardware).

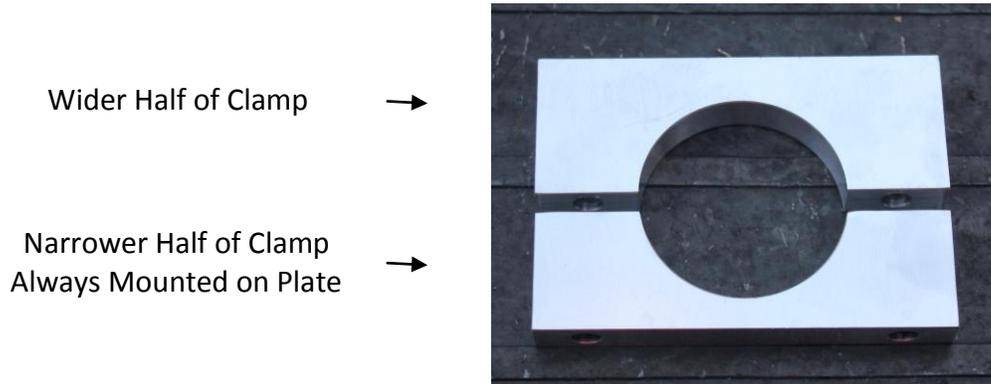


*Boom/Mast plate mounted on temporary mast  
(for illustrative purposes only - this configuration not valid for all antennas)*

Recommended method:

- 1) Mount a short (5 foot tall) temporary mast into the ground.
- 2) Mount the **Mast Plate** onto the short mast with **Mast to Mast Plate Kit**. Note that the Mast Clamps/Plates have 3/4" screws included to pre-mount the plate-side half of the clamps for easier assembly. The plate side of the Mast clamps have a tapped hole to accept the screws.

**IMPORTANT NOTE: All clamp sets have uneven halves (i.e. one half of the clamp set is narrower than the other); the narrower half is mounted on the plate side.**



- 3) Lay out the boom sections in the proper order, and measure and mark the mast position on the appropriate boom section.

**Mast position for JK2040 HAWK is 222" from the rear of the boom (Reflector side).**

- 4) Mount the marked boom section at the identified position onto the Mast Plate using the **Boom to Mast Plate Kit**. Mount the boom so that one set of the screw holes are parallel with the mast, so that when assembled, the bolt heads will face up (toward the sky) and the nuts will face down (toward the ground). The other set of screw holes will then be parallel with the ground.
- 5) Next, insert a boom sleeve into one end of the mounted boom section, and attach with the **Boom Hardware Kit**. Insert the next section of the boom onto the sleeve and attach.
- 6) Continue completing the rest of the boom assembly, making sure to attach the sections in the appropriate order.



Assembled Boom Joint

## STEP 2: Element Assembly

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The elements of the JK2040 HAWK are comprised of various telescoping sizes of aluminum tubing and are designed to be mounted on the underside of the boom, following the location and measurements below:

ELEMENT	POSITION ON BOOM FROM REAR END
40M REF	3"
20M REF	27"
20M DRV	92"
20M D1	132"
40M DRV	208"
20M D2	288"
40M D1	409"
20M D3	477"

First assemble both the 40M and the 20M **Driven Element Center Sections** ([STEP 2a](#)). Then, gather the Driven Element and other element center sections, and follow the instructions in the **Element to Element Channel/Plate** ([STEP 2b](#)) and the **Boom to Element Channel/Plate** ([STEP 2c](#)) sections coming after. Next, assemble the 40M Coil sections ([STEP 2d](#)). Once all the center sections are mounted on the boom at the identified locations, and the Coil sections are done, the rest of the element tapers will be assembled off the antenna ([STEP 2e](#)).

### **STEP 2a: Driven Element Center Section Assembly**

The 40M Driven 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 Driven Element Hardware Kit**. The 20M Driven Element center section is comprised of two (2) 18" long aluminum tubes with an outer diameter of 1-1/4", one (1) solid fiberglass rod (0.875"OD), and the hardware found in the **20M Driven 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 nylock 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 Driven Element center section can be mounted onto the element plates/channels and then onto the boom the same as the other element sections in the next step.

### **STEP 2b: 40M Element to Element Channel Assembly**

All JK2040 HAWK 40M element center sections are attached to an **Element Channel**. Gather the 40M Driven Element and other 40M element center sections (all 1-3/4" outer diameter tubes). Attach each 40M center section to a 40M element channel using two (2) **Black Polyamide Clamps** and the hardware from the **Element to Element Channel Kit**.

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

- 1) Center the mounting plate exactly at the middle of the center section tube.
- 2) Align the tubes so that when screws are used to attach the next taper, the screw heads will face up (towards the sky).
- 2) When mounting the Driven Element center, make sure that the exposed screws face away from the Element Plate (down, towards the ground)

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 2b: 20M Element to Element Plate Assembly**

All JK2040 HAWK 20M element center sections are attached to an **Element Plate**. Gather the 20M Driven Element and other 20M element center sections (all 1-1/4" outer diameter tubes). Attach each 20M center section to a 20M Element Plate using two (2) **Black Polyamide Clamps** and the hardware from the **Element to Element Plate Kit**.

Following the same process and alignments used for the 40M elements, center each 20M element center section on an element plate.



*20M center sections mounted on element plates*

Make sure to center the tubing exactly at the mid-point of the plate.

### **STEP 2c: Boom to Element Plate/Channel Assembly**

Once the 40M center sections are mounted on the channels and the 20M center sections are mounted on the plates, they are all attached to the boom using two (2) clamp sets and the appropriate hardware from the **Boom to Element Channel Kit** (for 40M) and the **Boom to Element Plate Kit** (for 20M). Follow the element positioning indicated in the table in the beginning of Step 2.



*20M (top) and 40M (bottom) center sections mounted to boom using two (2) clamp sets*

**REMEMBER:** All clamp sets have uneven halves (i.e. one half of the set is narrower than the other); the narrower half is mounted on the plate side.

**IMPORTANT:** It is advisable to have a tape measure that can measure down to 1/16th of an inch. Placing the element channels and plates on the boom accurately will ensure the most precise, accurate and effective antenna performance.

Before final torquing, re-check spacing and horizontal alignments of element center sections on the boom using the measurements in the table above. Minor adjustments (half inch to an inch) to element positions may be necessary in cases where the elements fall on the boom joints.

### **STEP 2d: 40M Coil Assembly**

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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.

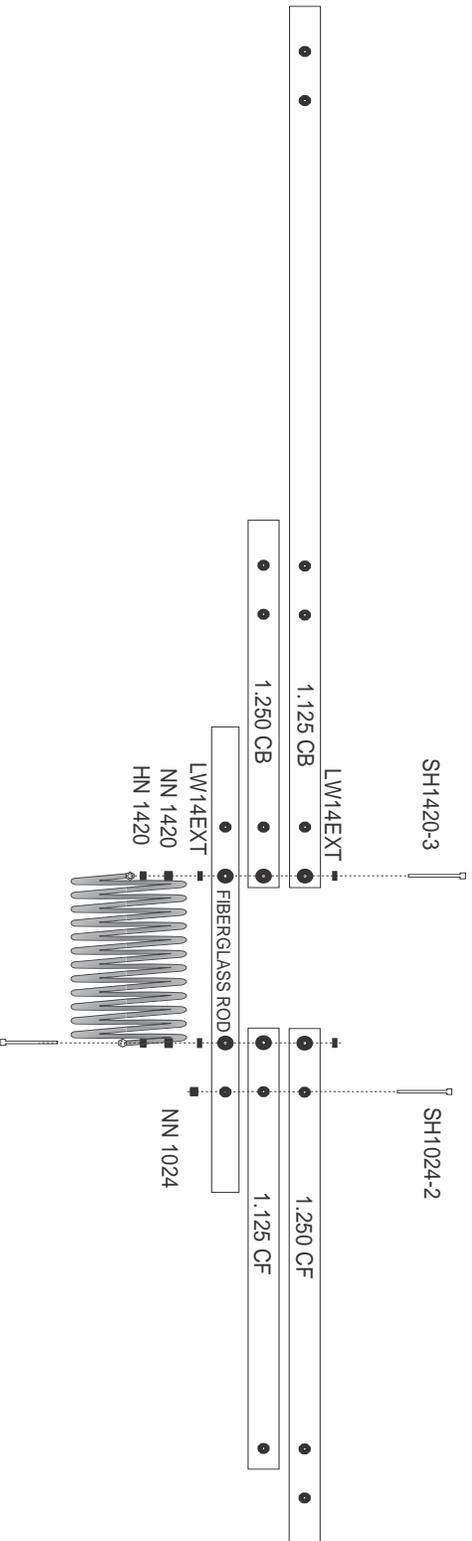
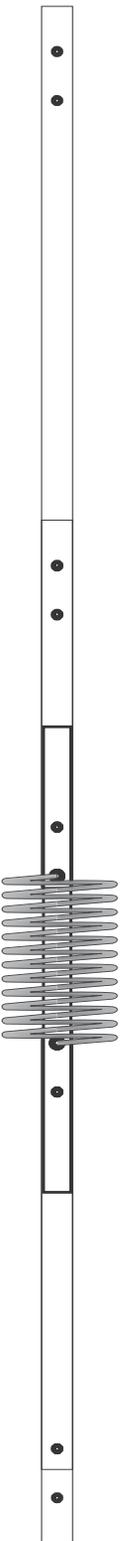


The fiberglass rod has 4 holes, two of which are 1/4" holes, and two of which are #10. The #10 holes are the outside holes from the center and are used for the mechanical mounting of the tubing to the fiberglass. The 1/4" holes are used for mounting the coil.

**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.

### 40 Meters Coil Section Assembly



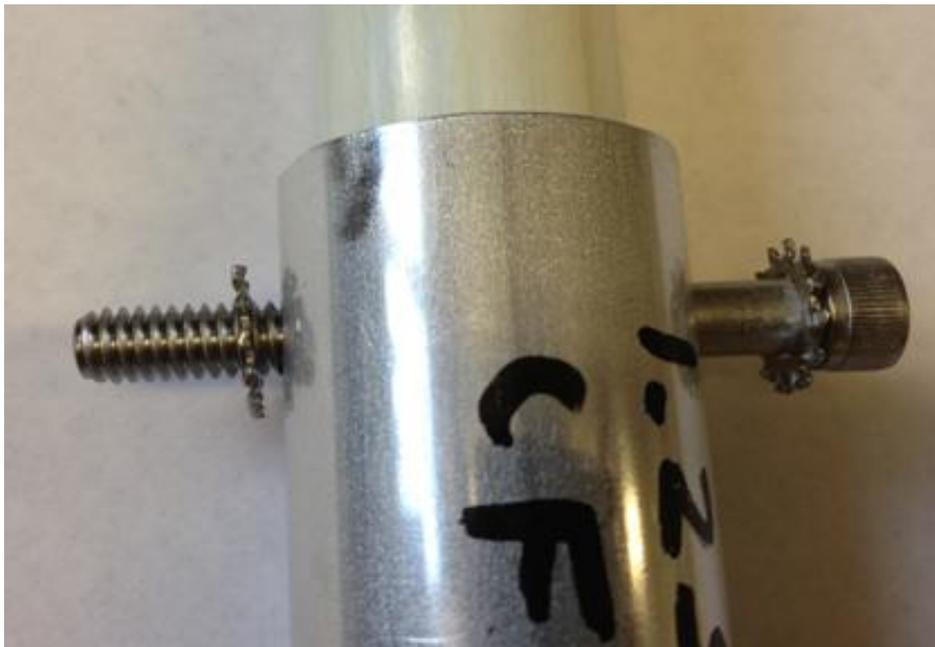
10-24 holes (outside) to attach fiberglass rod to aluminum tubes



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.



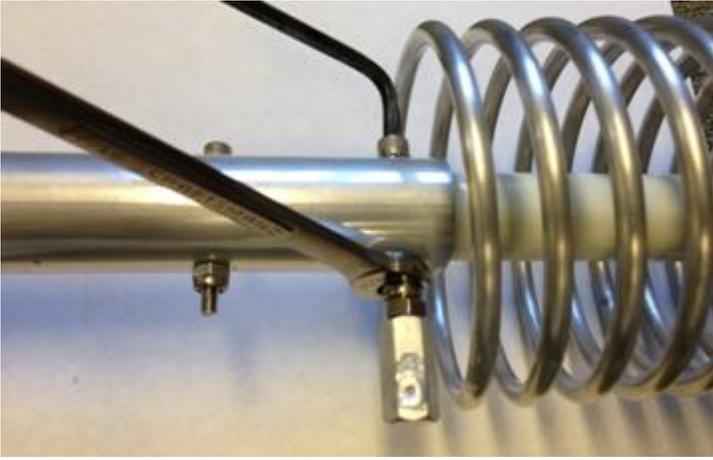
- 8) Follow these same steps with the remaining hole on the other side of the fiberglass rod, but this time insert the screw from the opposite side of the rod.
- 9) Wrap the provided silicone tape over the exposed section of the fiberglass rod (this tape has no adhesive, so it only bonds to itself –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



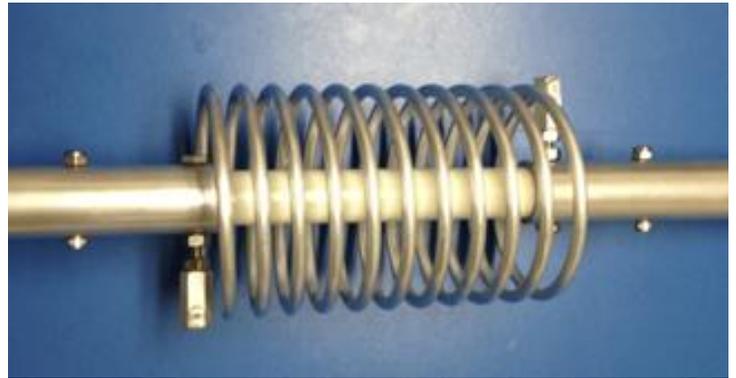
- 11) GENTLY tighten the hex-nut over the standoff to act as a jam nut.
- 12) Do the same on the other side.
- 13) Tighten the nylon-nut firm and tight along the tube.



**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 and 20M element center sections have been mounted to the boom at the appropriate locations, and the coil sections have been assembled, the remaining tubes can be sleeved in to complete the tapered element sections.

**40M:** The 40M D1 element has eight (8) tapered aluminum sections on each side of the 1.75” center section, ranging from 1.5” (largest) to .5” (smallest). The 40M Reflector and 40M DRV elements have nine (9) tapered aluminum sections, 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” (REF/DRV)	SH832-2	NN832
.75 - .625 Slit (D1)	SH832-2	NN832
.625” - .5 Slit” (REF/DRV)	SH832-1	NN832
.625” Slit - .5” (D1)	HC-2	none
.5” Slit - .375” (REF/DRV)	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.

Exposed Length	36"	30"	15"+15"	21"	30"	30"	30"	30"	30"	Tip Length	
<b>40M REF</b>	1.75"	1.5"	1.25"	1.125"	1"	.875"	.75"	.625"	.5" Slit	.375" is the tip	<b>11.5"</b>
<b>40M DRV</b>	1.75"	1.5"	1.25"	1.125"	1"	.875"	.75"	.625"	.5" Slit	.375" is the tip	<b>5"</b>
<b>40M D1</b>	1.75"	1.5"	1.25"	1.125"	1"	.875"	.75"	.625" Slit	.5 is the tip		<b>29.5"</b>

The tips lengths have been optimized for 7.150 +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).

**20M:** The 20M Reflector element has seven (7) tapered aluminum tube sections on each side, ranging from 1.125" (largest) to .375" (smallest). All other 20M elements have 6 tapered aluminum tube sections on each side of the center section, ranging from 1.125" (largest) to .5" (smallest).

The 1.25" - 1.125" transition, the 1.125" - 1" transition, and the 1" - .875" transition are assembled in a double-walled fashion:

- The 1.125" OD aluminum tube (36" long) acts as a doubler for 18" of the 1.25" OD tube
- The 1" OD aluminum tube (72" long) acts as a doubler for 21" of the 1.125" OD tube
- The .875" OD aluminum tube (26" long) acts as a doubler for 36" of the 1" OD tube

20M Transition	Screw Size	Nylon Nut Size
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" (REF ONLY)	SH832-2	NN832
.75" - .625" Slit	SH832-2	NN832
.625" - .5" Slit" (REF ONLY)	SH832-1	NN832
.625" Slit - .5"	HC-2	none
.5" Slit - .375" (REF ONLY)	HC-2	none

- 1) Insert 18" of the 1.125" OD aluminum tube (end with no holes) into the 1.25" OD center section. The holes of the two tubes should be aligned. Attach using the appropriate hardware (**20M Element Hardware Kit**) as shown in the table above. (Use a drop of anti-seize paste on all screws)
- 2) Insert 21" of the six-foot 1" OD aluminum tube assembly (side with no holes) into the 1.125" OD tube. Align the holes between the tubes and attach using appropriate hardware.
- 3) Continue to assemble and attach the progressively smaller tapers of aluminum tubing, using the appropriate hardware, as shown in the table below:

Exposed Lengths	18"	18"	53"	30"	30"	30"	30"		Exposed Tip Length
<b>Reflector Element</b>	1.25"	1.125"	1"	.875"	.75"	.625"	.5" Slit	.375" is the tip	9.0"
<b>Driven Element</b>	1.25"	1.125"	1"	.875"	.75"	.625" Slit	.5" is the tip		33"
<b>D1 Element</b>	1.25"	1.125"	1"	.875"	.75"	.625" Slit	.5" is the tip		25"
<b>D2 Element</b>	1.25"	1.125"	1"	.875"	.75"	.625" Slit	.5" is the tip		20"
<b>D3 Element</b>	1.25"	1.125"	1"	.875"	.75"	.625" Slit	.5" is the tip		12"

*Please feel free to cut the lengths of the tips to equal tip-length + 6 inches sleeve-in*

- 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. Please refer to the diagram for additional clarification.

**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).**

### **Step 3: Truss Assembly**

- 1) Mount the four (4) provided **Boom to Truss Cable Clamps** onto the boom at the following locations:
  - At 95 inches and 125 inches from the mast/center on the boom's Reflector side
  - At 190 inches and 125 inches from the mast/center on the boom's Director side
- 2) Attach the two (2) clamps from the **Truss Mast to Truss Cable Kit**, approximately 6 inches apart from each other, 30 inches or more above the boom, using the provided nuts and bolts; mount the clamps so that the screws are positions perpendicular to the boom.



- 3) Mount the eye-side of the **Jaw-Eye Turnbuckles** (packaged with Truss Cables) on the Truss Mast to Truss Cable Clamps so that each clamp has one turnbuckles attached on each side, and so that one larger and one smaller turnbuckle is on the Director-side of the mast, and one larger and one smaller is on the Reflector-side of the mast.
- 4) Loosen the turnbuckles and apply Penetrox to the threads.
- 5) Run the 190 inch truss cable from the jaw-side of the larger turnbuckle to the Director-side Boom Truss Clamp located 190 inches from the mast; run one 125 inch truss cable from the jaw-side of the remaining larger turnbuckle to the Reflector-side Boom Truss Clamp located 125 inches from the mast. Ensure that the cables are tight.
- 6) Run the remaining 125 inch truss cable from the jaw side of the smaller turnbuckle to the Director-side Boom Truss Clamp located 125 inches from the mast; run the 95 inch truss cable from the jaw side of the last, smaller turnbuckle to the Reflector-side Boom Truss Clamp located 95 inches from the mast. Ensure that the cables are tight.
- 6) Adjust the tensions of the turnbuckles as needed and level the boom after mounting the antenna on the mast.

#### **STEP 4: Balun (40M & 20M) and Shunt Coil (40M only) Assembly**

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The 40M portion of the JK2040 HAWK is shunt loaded for a 50-ohm match:

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



- 2) Next, mount the coil and the balun “ L” leads onto the exposed screws, with the balun on one side and the shunt coil on the other.
- 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) Check the entire setup for snug fit and make sure there are no loose joints in the coil or the balun leads.

The 20M portion of the JK2040 HAWK is a direct 50 ohm feed:

- 1) Follow the same steps to attach the 20M balun as for the 40M portion above, just minus a shunt coil.

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

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**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. There is so much time involved in installing of antennas that is not worth skipping the dimension documentation. We recommend that make a note of all your element spacing and lengths down to a ¼”.

**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 30 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 SSB, the dip will be usually below 7.0MHz and close 6.875 MHz depending on height above ground.***

**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/hawk.html>

**JK2040 HAWK - Parts List**

				Description	
<b>BOOM TO MAST ASSEMBLY</b>					
BMP-2				12" x 18" Mast Plate 3/8" (9mm) thick	1
Boom to Mast Plate					
BMC		3"		Boom to Plate clamps	4
	HH3816	5"		Hex Head Screw 3/8-16	8+2
	NN3816			Nylon Nut 3/8-16	8+2
Mast to Mast Plate					
MPC		3"		Mast to Plate clamps	4
	HH3816	5"		Hex Head Screw 3/8-16	8+2
	NN3816			Nylon Nut 3/8-16	8+2
	SH832-0	3/4"		Socket Head Screw 8-32	4+2

<b>BOOM &amp; TRUSS ASSEMBLIES</b>					
AT3.0Boom 8ft-2S				Boom Section 8ft 3.0" OD	3
AT3.0Boom 8ft-1S				Boom End Section 8ft 3.0" OD	2
AT2.75Sleeve				Boom Sleeve	4
Boom Assembly Hardware					
	HH3816	3-3/4"		Hex Head Screw 3/8-16	32+2
	NN3816			Nylon Nut 3/8-16	32+2
Boom to Truss Cable					
BTC		3"		Boom-Truss Cable Clamps	4
	HH3816	4-1/2"		Hex Head Screw 3/8"-16	8+1
	NN3816			Nylon Nut 3/8-16	8+2
Truss Cables + Turnbuckles					
TC125		T2 & T4		125" truss cable	2
TC95		T3		95" truss cable	1
TC190		T1		190" truss cable	1
TBJE800				Turnbuckle (800#) for T3 & T4	2
TBJE1200				Turnbuckle (1200#) for T1 & T2	2
Truss Mast to Truss Cable					
MTC		60mm		Mast to Truss Cable Clamps for BMP-2	2
	HH3816	5"		Hex Head Screw 3/8"-16 (3-3/4")	4+1
	NN3816			Nylon Nut 3/8-16	4+2
Truss Mast to Mast Plate					
MTC		60mm		Mast to Plate Clamps for BMP-2	2
	HH3816	5"		Hex Head Screw 3/8"-16	4+1
	NN3816			Nylon Nut 3/8-16	4+2

<b>BOOM TO ELEMENT ASSEMBLIES</b>					
Boom to 40M Channel					
BEC3.0		3"	Boom to Element Clamp		6
	NN1420	4-1/2"	Nylon Nut 1/4-20		12+1
	HH1420		Hex Head Screw 1/4-20 (4-1/2")		12+2
Boom to 20M Plate					
BEC3.0		3"	Boom to Element Clamp		10
	NN1420	4-1/2"	Nylon Nut 1/4-20		20+1
	HH1420		Hex Head Screw 1/4-20 (4-1/2")		20+2
40M Channel Assembly					
40M Channel-1			40M Element Center Plate		3
BC1.75			Black Polyamide clamps 1.75" ID		12
	SH1420-7		Socket Head Screw 1/4"-20 (3")		24+2
	NN1420		Nylon Nut 1/4-20		24+2
20M Plate Assembly					
BEP-1			9" x 3" Boom to Element Plate		5
BC1.25			Black Polyamide clamps 1.25" ID		10
	SH1420-5		Socket Head Screw 1/4"-20 (2-3/4")		20+2
	NN1420		Nylon Nut 1/4-20		20+2

<b>40M ELEMENT ASSEMBLIES</b>					
6AT1.75			6 ft Alum Tube 1.75" OD		3
3AT1.5			3 ft Alum Tube 1.5" OD		6
1.25 CF			21" Alum Tube 1.25" Coil Front		6
1.25 CB			15" Alum Tube 1.25" Coil Back		6
1.125 CF			18" Alum Tube 1.125" Coil Front		6
1.125 CB			3 ft Alum Tube 1.125" Coil Back		6
3AT1.0			3 ft Alum Tube 1" OD		6
3AT.875			3 ft Alum Tube .875 OD		6
3AT.75			3 ft Alum Tube .75" OD		6
3AT.625 (REF/DRV)			3 ft Alum Tube .625" OD		4
3AT.5 (D1)			3 ft Alum Tube .5" OD		2
3AT.625S (D1)			3 ft Alum Tube .625" OD (slit end)		2
3AT.5S (REF/DRV)			3 ft Alum Tube .5" OD (slit end)		4
3AT.375 (REF/DRV)			3 ft Alum Tube .375" OD		4

<b>Coil Assembly</b>					
40M Coils			40M Coils		6
FG1.0 Coil			Fiberglass rod 1" OD		6
	SH1024-2		Socket Head Screw 10-24 (1-3/4")		12+2
	NN1024		Nylon Nut 10-24		12+2
	SH1420-3		Socket Head Screw 1/4"-20 (2-1/4")		12+2
	NN1420		Nylon Nut 1/4"-20		12+2
	PN1420		Hex Nut 1/4"-20		12+2
	LW14ExT		Lock Washer 1/4" External Tooth		24+2
	Tape		Tape		2

Element Assembly Hardware				
	SH1024-1		Socket Head Screw 10-24 (1-1/2")	12+2
	SH1024-2		Socket Head Screw 10-24 (1-3/4")	12+2
	SH1024-3		Socket Head Screw 10-24 (2")	12+2
	SH1024-4		Socket Head Screw 10-24 (2-1/2")	12+2
	NN1024		Nylon Nut 10-24	48+2
	SH832-4		Socket Head Screw 8-32 (1-1/2")	12+2
	SH832-3		Socket Head Screw 8-32 (1-1/4")	12+2
	SH832-2		Socket Head Screw 8-32 (1-1/8")	12+2
	SH832-1		Socket Head Screw 8-32 (1")	12+2
	NN832		Nylon Nut 8-32	48+2
	HC-2		Hose Clamp 9/16" Band Width	6+2

40M DRIVEN ELEMENT HARDWARE				
	FG1.5DE		Fiberglass Rod for Driven Element	1
	BH1024-2	2-1/4"	Button Head Screw 10-24	2+1
	BH1024-3	3"	Button Head Screw 10-24	2+1
	NN1024		Nylon Nut 10-24	4+2
	FW10		Flat Washer #10	4+2
	LW10ExT		Lock Washer #10 External Tooth	4+2
	SHCOIL		Shunt Coil	1

20M ELEMENT ASSEMBLIES				
	3AT1.25		3 ft Alum Tube 1.25" OD	5
	3AT1.125		3 ft Alum Tube 1.125" OD	10
	6AT1.0		6 ft Alum Tube 1" OD	10
	3AT.875		3 ft Alum Tube .875" OD	10
	3AT.75		3 ft Alum Tube .75" OD	10
	3AT.625 (REF ONLY)		3 ft Alum Tube .625" OD	2
	3AT.5		3 ft Alum Tube .5" OD	8
	3AT.625S		3 ft Alum Tube .625 OD (slit end)	8
	3AT.5S (REF ONLY)		3 ft Alum Tube .5" OD (slit end)	2
	3AT.375 (REF ONLY)		3 ft Alum Tube .375" OD	2

Element Assembly Hardware				
	SH1024-1		Socket Head Screw 10-24 (1-1/2")	20+2
	SH1024-2		Socket Head Screw 10-24 (1-3/4")	20+2
	NN1024		Nylon Nut 10-24	40+2
	SH832-1		Socket Head Screw 8-32(1")	4+2
	SH832-2		Socket Head Screw 8-32 (1-1/8")	20+2
	SH832-3		Socket Head Screw 8-32 (1-1/4")	20+2
	SH832-4		Socket Head Screw 8-32 (1-1/2")	20+2
	NN832		Nylon Nut 8-32	60+2
	HC-2		Hose Clamp 9/16" Band Width	10+2

20M DRIVEN ELEMENT HARDWARE					
	FG1.0DE			Fiberglass Rod for Driven Element	1
	BH1024-2	2-1/4"		Socket Head Screw 10-24	2+1
	BH1024-1	1-3/4"		Socket Head Screw 10-24	2+1
	NN1024			Nylon Nut 10-24	4+2
	FW10			Flat Washer #10	4+2
	LW10ExT			Lock Washer #10 External Tooth	4+2