JK MidTri

(2017 Edition)

3-Band Yagi (20M/15M/10M) – 24Ft Boom

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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 boom to mast u-bolts)

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 accidently 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

The JK MIDTRI comes with one (1) **8-ft boom center** sections (sleeve assembly holes on both ends), two (2) **8-ft boom rear-end** section & **front -end** section (sleeve assembly holes on one end) which are connected to each other using an internal sleeve (1/4" thick) at the joint. The boom has a 2" OD.

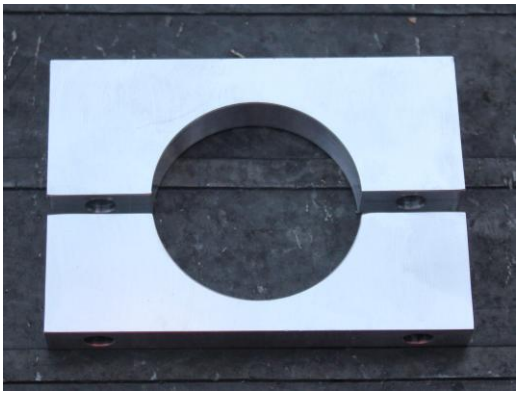
Assembled Boom Joint

Insert the internal sleeve into one of the boom sections, line up the holes and attach the sleeve using the supplied nuts and bolts in the **Boom Hardware Kit**. Do not over-tighten - once the bolt is seated firmly, make one more turn. Attach the other boom sections the same way to complete boom assembly.

STEP 2: Boom to Mast Plate and Clamps

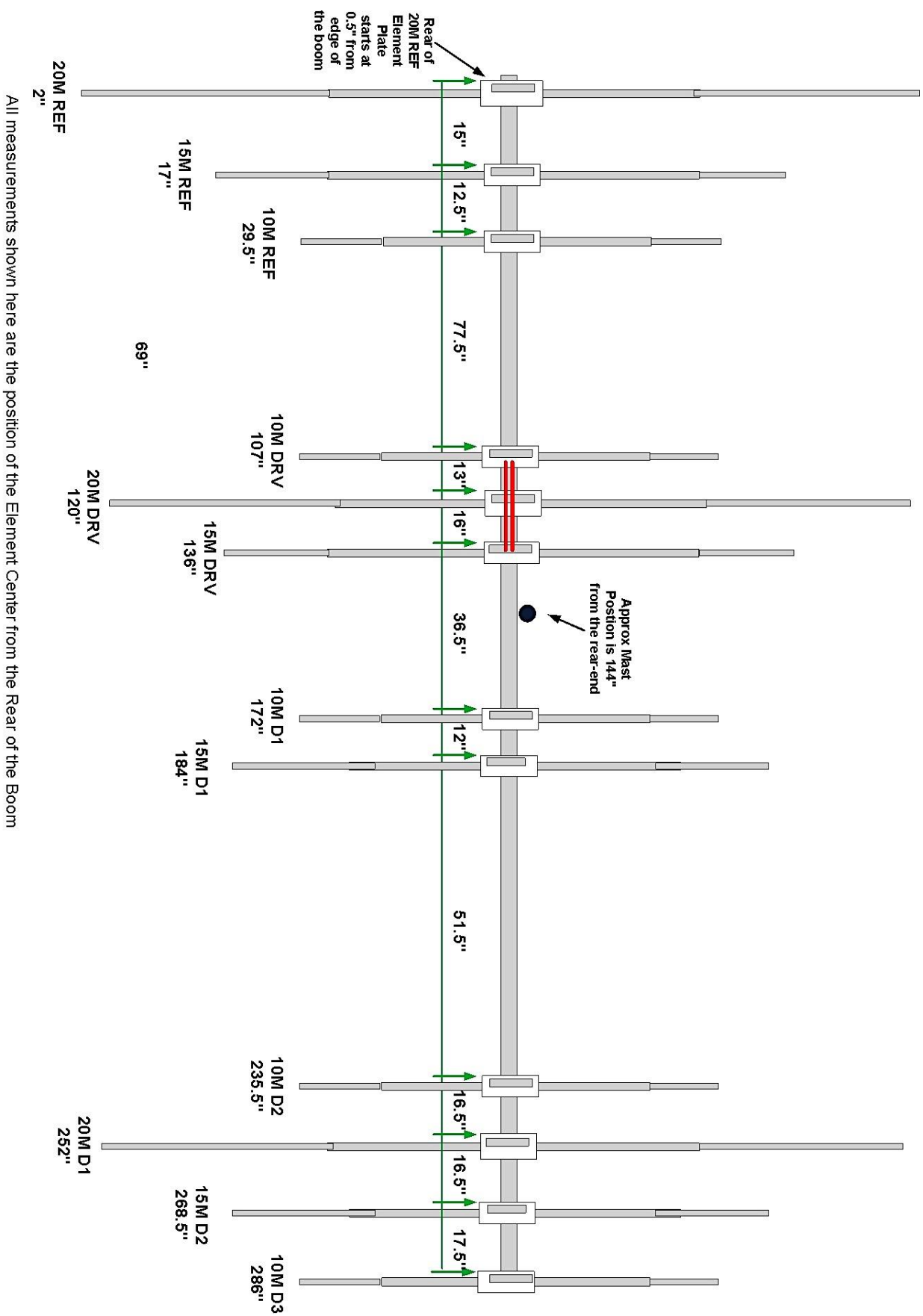
The JK MIDTRI comes with a 10" x 7" **Boom to Mast Plate**. The **Boom to Mast Plate Kit** includes four (4) sets of clamps sized for the JK MIDTRI boom, along with appropriate assembly hardware. The **Mast to Mast Plate Kit** include four (4) U-bolt clamps sized for a 2" OD mast, along with appropriate assembly hardware.

Boom to Mast Plate attached to Boom
(Illustrative picture used)



Aluminum Clamp with uneven halves
(narrower half always mounted on plate side)

Diagram 1


Rear of 20M REF Element Plate starts at 0.5" from edge of the boom
20M REF
2"
15M REF
17"
10M REF
29.5"
69"
20M DRV
120"
15M DRV
136"
10M DRV
107"
20M D1
252"
15M D2
268.5"
10M D3
286"
15M D1
184"
10M D1
172"
10M D2
235.5"
15"
12.5"
77.5"
13"
16"
36.5"
12"
51.5"
16.5"
16.5"
17.5"
Approx Mast Postion is 144" from the rear-end
All measurements shown here are the position of the Element Center from the Rear of the Boom

Recommended assembly method: Mount a short (5 foot tall) temporary mast into the ground. Mount the **Boom to Mast Plate** onto the short mast with the U-bolts from the **Mast to Plate Kit** and continue with assembly of the antenna. Once finished, remove the U-bolts and re-attach the assembled antenna on your tower.

Mast position for the JK MIDTRI is **144"** from the reflector-end of the Boom.

Measure and mark the mast position on the boom, and mount the boom at the identified position on the plate using the **Boom to Mast Plate Kit**. Mount the boom so that the bolt head faces up (towards the sky) and the nut faces down (towards the ground).

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.

BEFORE THE ELEMENT ASSEMBLY, PLEASE SLIDE THE TRUSS CLAMP ONTO THE BOOM (refer STEP5 /PAGE 13)

STEP 3: JK MidTri Element Assembly

The elements of the JK MIDTRI are comprised of various telescoping sizes of aluminum tubing attached to each other using counterbored holes to create a mechanically and electrically superior joint in a 3" overlap. Elements are designed to be mounted on the underside of the boom, following the location and measurements of **Diagram 1** on the previous page.

First assemble the **Driven Element Center Sections** (STEP 3a). Then, gather the Driven Element and other element center sections, and follow the instructions in the **Element to Element Plate** (STEP 3b) and the **Boom to Element Plate** (STEP 3c) sections coming after. Once all the center sections are mounted on the boom at the identified locations, the rest of the element tapers will be assembled off the antenna (STEP 3d).

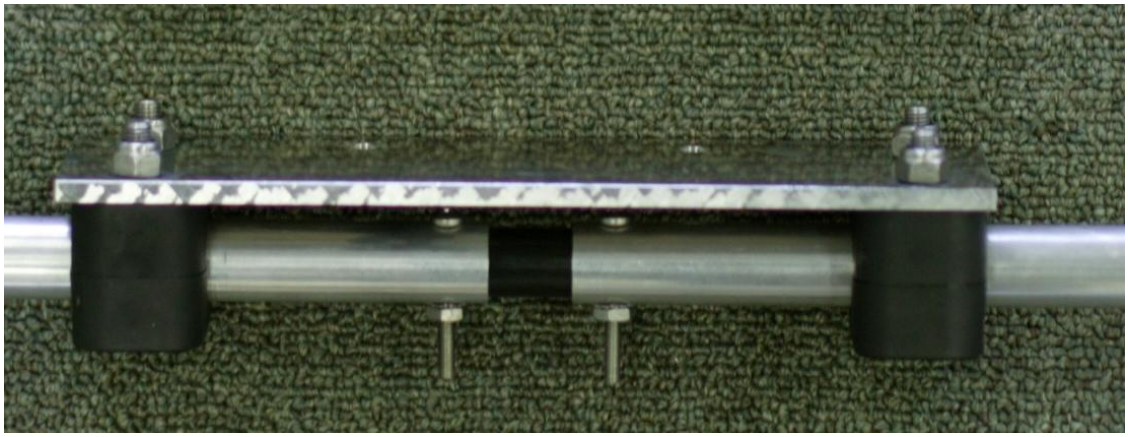
STEP 3a: Driven Element Center Section Assembly

The JK MIDTRI has three Driven Elements - one for each band (20M, 15M, 10M). Each Driven Element center section is comprised of two (2) aluminum tubes, one (1) solid fiberglass rod, and the screws and nuts found in the appropriately marked **Driven Element Hardware Kit**. (20M element also uses a 1.125"OD doubler tube)

	20M DRV	15M DRV	10M DRV
ALUMINUM TUBES (2)	36" LONG 1.25" OD	9" LONG 1" OD	18" LONG .75" OD
FIBERGLASS ROD	1" OD	.875" OD	.625" OD
BUTTON HEAD SCREWS	3" LONG	2-1/2" LONG	

For each band's Driven Element center section, the appropriately sized fiberglass rod is used to join together the two corresponding aluminum tubes (see chart above). Slide one end of the fiberglass rod inside the end of one tube and align the holes. Place the screws through the hole and tighten with a Keps/Nyloc nut. Do the same on the other side so that the fiberglass rod has aluminum tubes attached on both sides.

NOTE: The head of the button head screw is to be placed on the same side as the counterbored hole on the opposite end of the tube. The button head screws form the studs that the transmission lines attach to, and these need to be pointing down when assembled and all counterbored holes facing up.



Completed Driven Element Assembly mounted on Element Plate

The aluminum tube/fiberglass rod assemblies of the driven element center sections can be mounted on the element plates and then onto the boom the same as the other element sections.

STEP 3b: Element to Element-Plate Assembly - Reflector, Driven and Director(s)

The 20M, 15M and 10M Element center sections (Driven Element, Reflector & Directors) are all attached to an **Element Plate** using the **Element to Element-Plate Kit**.

Element being mounted to Element Plate using Black Clamps and nylon nuts

Take the center (largest) section of each element (see chart below), and attach to an element plate using two (2) **Black Polyamide Clamps** and the appropriate hardware from the corresponding **Element to Element Plate Kit**. Make sure to mount the tubing so that the larger holes used for element taper assembly face up (towards the sky) and NOT down (towards the ground).

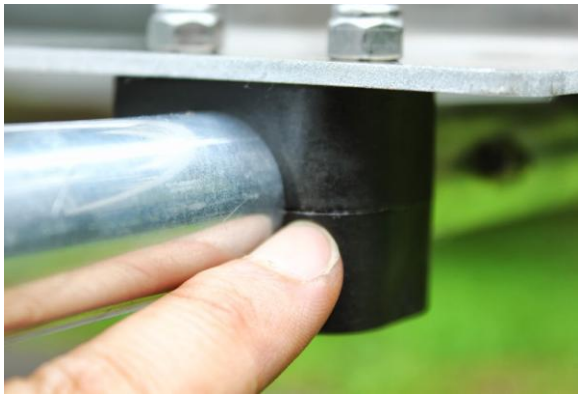
Before applying final torque to the black clamps, there are two alignments that have to be completed:

1) Center the mounting plate on the element center section.
2) There are holes drilled on each side of the element center sections. **Place the larger counter-bored holes face up on the same side as the nuts are on the mounting plate**. In other words, the plate will be horizontal when mounted (with the black clamps on the underneath), the nuts will be on the topside of the plate and the counterbored holes should be facing straight up.

	20M	15M	10M
CENTER SECTION OD & BLACK CLAMP ID	1.25"	1"	.75"

After you do the alignments, 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.**

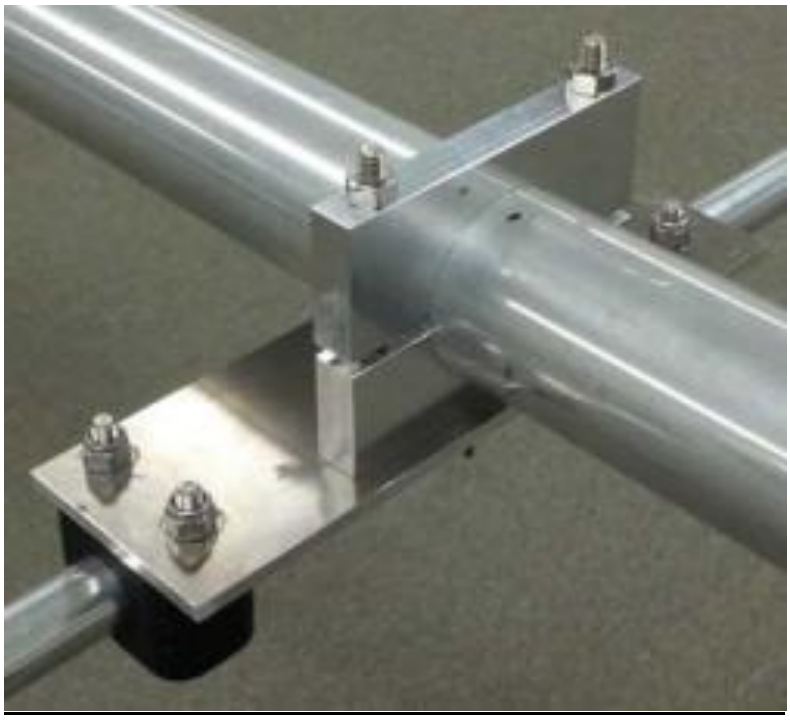
CAUTION: Continuous over-tightening can cause the screw-head to jam through the black clamps holes.



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

STEP 3c: Boom to Element Plate Assembly

Once the center sections are mounted on the plates, they can be attached to the boom using one (1) clamp set and the appropriate hardware from the **Boom to Element Plate Kit**. Follow the element positioning indicated in the diagram above.



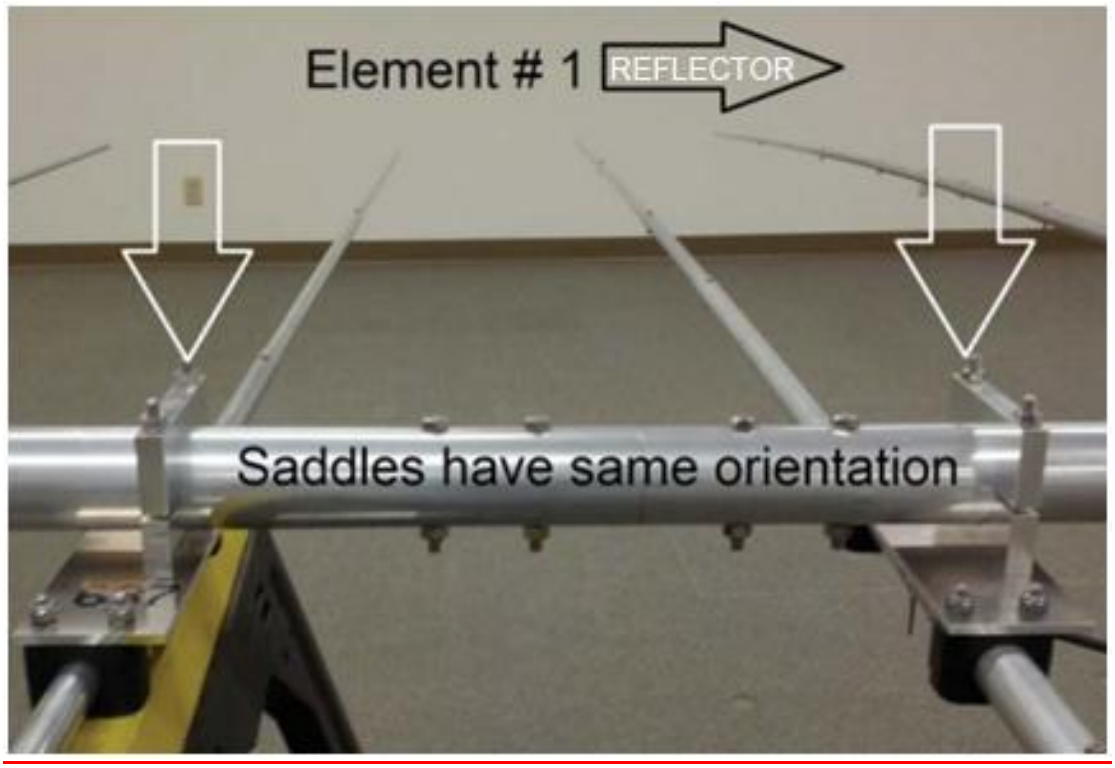
Element Plate mounted to Boom using Saddle clamp

NOTE: The placement of the Driven Elements will also be guided by the attachment of the Transmission Lines (see section on Transmission Line Assembly for more details). Therefore, do NOT do final tightening of the nuts on the Boom to Element Clamps holding the Driven Elements until the Transmission Line is in place.

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: Since JK MIDTRI uses only 1 clamp per element plate, and the clamp is mounted off-center, Be SURE TO orient the clamp side of the plate closest to the reflector of the antenna, i.e the side towards the 20M Reflector element.**

- **IMPORTANT: It is advisable to have a tape measure that can measure down to 1/16th of an inch. Placing the element 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 illustrated on Diagram 1.

STEP 3d: Element Taper Assembly

Once the element plates/element center sections have been mounted to the boom at the appropriate locations, the remaining tubes can be sleeved in to complete the tapered element sections, based on the schedule in **Diagram 2** (in the following page).

JK MIDTRI ELEMENT TAPER SCHEDULE

EXPOSED LENGTHS

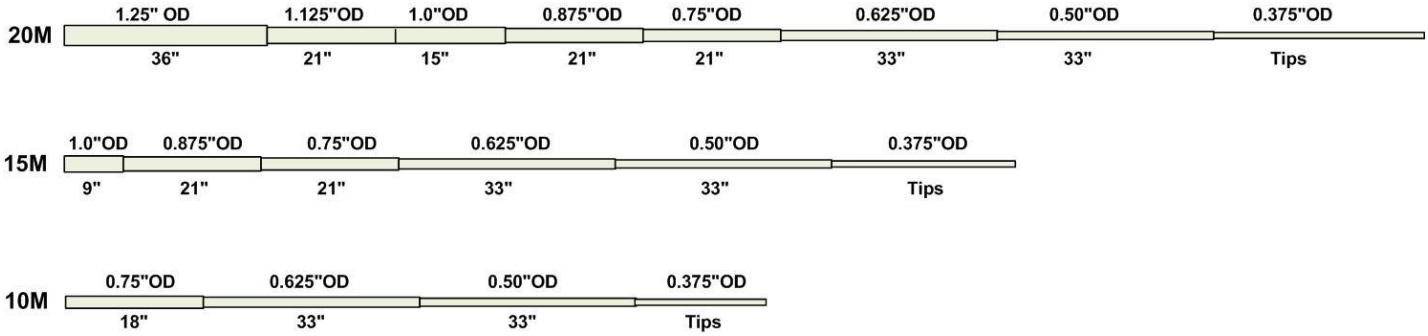
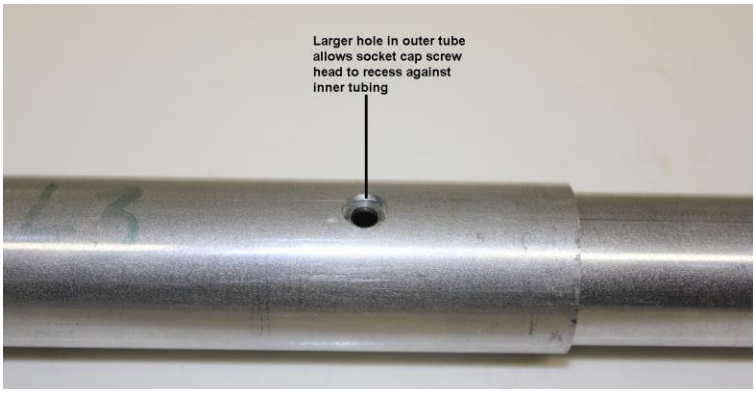


Diagram 2

Note the joint in the picture below illustrating the counterbored (larger) hole in the outer tube to tightly nest the screw head.



Each tube has one larger, counterbored hole drilled on one end, on one side. **The side of the tube with the counterbored hole is ALWAYS the outer tube of a joint, with the smaller outer-diameter tube sleeved inside.**

The element sections are joined together with a single socket head cap screw. In all cases where element sections are telescoped together, the head of the socket head screw will be inserted into the larger diameter counterbored hole through the outer tubing and exit out the other side of the larger diameter tubing.

IMPORTANT: Always be aware of the orientation of the larger countersunk hole, and keep them all on the same side as you insert the next tubing section. This way all the socket cap heads remain on the same side of the element tubing.

	1.25" OD TUBE	1.125" OD TUBE	1" OD TUBE	.875" OD TUBE	.75" OD TUBE	.625" OD TUBE	.5" OD TUBE	.375" OD TUBE
20M	CENTER	X	X	X	X	X	X	X
15M			CENTER	X	X	X	X	X
10M					CENTER	X	X	X

Following the taper schedules above, assemble the element tubes in descending order on both sides of the element center sections. Align the holes and attach them to each other firmly using the appropriate screws and nuts in the **Element Hardware Kits**. Do not forget to use the anti-seize paste.

NOTE: Nylon nuts used on element sections should not be orque so much that they crush the tubing. The nut only needs to seat firmly, as the nylon lock will keep it from loosening.

Screw fits into recessed hole – face up

Nylon Nut placed on opposite end – face down

Band	Transition	Screw Size	Nut
20M	1.25” – 1.125”	1-1/2” (SH1024-1)	NN1024
20M	1.125” – 1.0”	1-1/2” (SH1024-1)	NN1024
20M/15M	1" - .875"	1-1/4" (SH832-2)	NN832
20M/15M	.875" - .75"	1-1/4" (SH832-2)	NN832
20M/15M/10M	.75" - .625"	1" (SH832-1)	NN832
20M/15M/10M	.625” - .5”	3/4" (SH632)	NN632
20M/15M/10M	.5" - .375"	3/4" (SH632)	NN632

NOTE: The screw heads should all be on the top side of the element (facing the sky) and the nuts on the bottom side of the element (facing the ground).

Exposed Tip lengths of the elements (.375" OD tubes) are as follows:

20M REF	20M DRV	20M D1	15M REF	15M DRV	15M D1	15M D2	10M REF	10M DRV	10M D1	10M D2	10M D3
40"	32.5"	7"	26"	26-1/4"	17-3/8"	18”"	25"	19”	17-1/2"	17-3/8"	15-1/4”

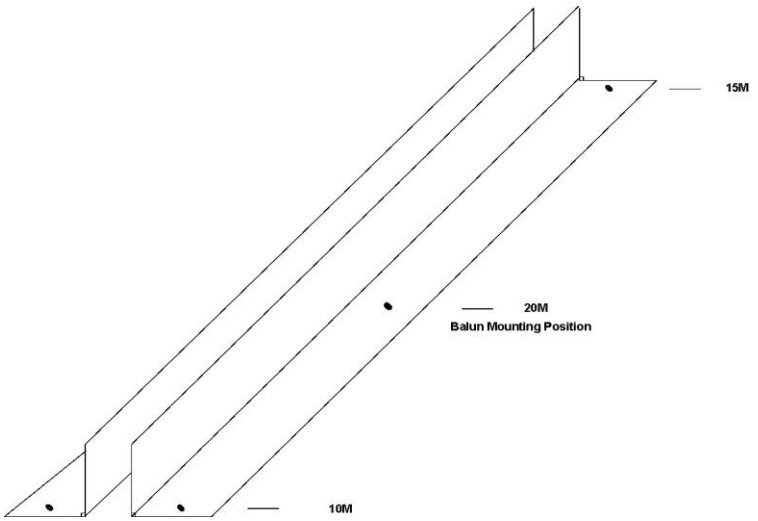
Once all element tapers are installed, it is time to do final horizontal alignment of all the elements on the boom. Sight down the boom and align any elements that need it. Complete final torquing of nuts on all boom to element clamps.

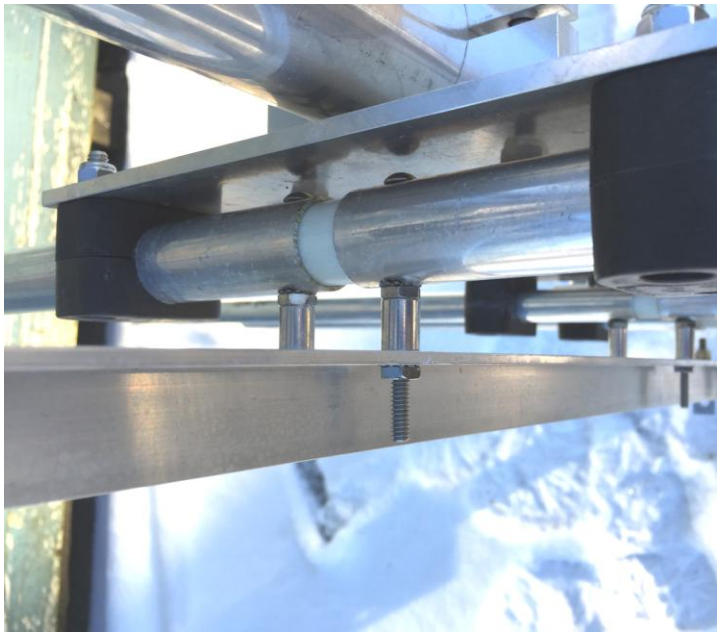
STEP 4: Transmission Lines & Balun Assembly

The JK MIDTRI is delivered with “pair” of L shaped angle aluminum strip that’s 30 inches long. Once mounted, the gap between the transmission lines will be approximately 3/8” (0.375”). The final nut below the transmission line is always the Nyloc Nut.

Aluminum spacers are placed between the transmission lines for 15M &10M driven elements EXCEPT the 20M Driven Element to keep the transmission lines level. There are 2 different sizes of spacers, which are found along with their corresponding Nyloc nuts in the **Transmission Line/Balun Kit**:

- Aluminum Spacer #1 (5/8" long) goes on the 10M Driven elements.
- Aluminum Spacer #2 (1/2" long) goes on the 15M Driven elements.





The JK MIDTRI is delivered without a balun. We recommend a 1:1 current balun since the antenna is designed to be fed with a 50 Ohm balanced source, bringing the antenna to true optimum performance.

Mount your balun to the transmission line beneath the 20M Driven element, using the “L” shaped brackets and hardware provided in the **Transmission Line/ Balun Kit.** Use the aluminum spacers to bring the mounting position of the “L” to the balun, just to the point where the balun can be just below the transmission lines. If preferred, a simple length of tie-wrap could be used to secure the balun to the transmission line. Use the supplied **Nyloc** Nut to tighten the “L” brackets below the transmission line and spacers.

IDEAL SPACING FOR BALUN STUDS CENTER to CENTER = 1-3/8”

(Using a longer lead from the balun to the transmission line can alter the SWR characteristics on all bands. If using a different lead than the one provided please make sure that’s it is not more than 2-3 inches long.

Most Important !!

Please make sure to route the coax away from the Transmission line. It's very important that the coax from/to the balun is not secured or attached or touches the Transmission line. You can loop it around sideways and then go over to the boom and attach there.

STEP 5: Truss Assembly

1) Mount the two (2) clamps in the **Boom to Truss Cable Kit** onto the boom at the following locations:

   - At approximately 85 inches from the mast/center on the boom's Reflector side
   - At approximately 85 inches from the mast/center on the boom's Director side

1) Attach the clamp from the **Mast to Truss Cable Kit** onto the mast, 36 inches or more above the boom, using the provided hardware. Use the plain Hex Nut with Lockwasher and then add the Flat Washer before inserting the Turnbuckles.

3) Mount the eye-side of each of the **Jaw-Eye Turnbuckles** (packaged with **Truss Cables**), one on either side of the Mast to Trust Clamp. Loosen the turnbuckles and apply Penetrox to the threads. Add another Flat Washer and then complete with the Nyloc Nut to the Hex Screw on the Mast clamp.

4) Adjust the tensions of the turnbuckles as needed and level the boom after mounting the antenna on the mast.

STEP 7: 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. There is so much time involved in installing these antennas that is not worth skipping the dimension documentation. We recommend that make a note of all your element spacings and lengths down to a ¼". Diagram 1 on page 4 shows the element spacings and Diagram 2 on page 9 shows the element taper lengths for the JKMidTri. The tip lengths for all JK MidTri elements are on page 10.

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 every band. Do not be concerned unless the SWR is high on all 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 the three supported frequency ranges for the JKMidTri. As long as you start to see a dip somewhere around (above or below) each of the three bands, you may proceed with installation.

For example at 4Ft-5Ft off the ground, the dip on 20M will be around 14.0MHz, the dip on 15M will be around 21.1MHz and the dip on 10M will approx 1.5:1 at 28.5MHz.

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. The boom to mast plate is supplied with saddle clamps to mount to a 2" outer diameter mast (user supplied). The JK MidTri antenna is designed to be fed with 50 Ohm coaxial cable such as RG-8 or RG-213. 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.

JK MidTri 2017 Parts List

			Description	
BOOM TO MAST ASSEMBLY				
BMP 6 (New)		for 2" mast	10" x 7" Mast Plate	1
Boom to Mast Plate				
BMC 2.0-3i-5/8		2"	Boom to Plate clamp	4
	HH51618	3-1/2"	Hex Head Screw 5-16/18	8+2
	NN51618		Nylon Nut 5-16/18	8+2
Mast to Mast Plate				
U-Bolt		2"	Mast to Plate clamp	4
BOOM & TRUSS ASSEMBLIES				
AT2.0Boom 8ft-1S			Boom End Section 8ft 2.0" OD	2
AT2.0Boom 8ft-2S			Boom Center Section 8ft 2.0" OD	1
AT1.75Sleeve			Boom Sleeve	2
Boom Hardware				
	HH3816	2-3/4"	Hex Head Screw 3/8-16	8+2
	NN3816		Nylon Nut 3/8-16	8+2
Boom to Truss Cable				
BTC2.0		2"	2" Boom Brackets for Truss Cables	2
	HH3816	3-1/4"	Hex Head 3/8-16	4+1
	NN3816		Nylon Nut 3/8-16	4+1

Truss Cables + Turnbuckles				
TC85			85" truss cable	1
TC85			85" truss cable	1
TBJE800			Turnbuckle (800#)	2
Mast to Truss Cable				
BEC2.0-3i-3/8			Mast - Truss Clamp	1
	HH3816		Hex Head Screw 3/8-16	2+1
	HN3816	4-1/2"	Plain Hex Nut 3/8-16	2+1
	NN3816		Nylon Nut 3/8-16	2+1
	FW38		Flat Washer 3/8	4+2
	LW38		Lock Washer 3/8	2+1
BOOM TO 20M ELEMENT ASSEMBLIES				
BEP-3		9" x 3"	Element Plate for 20M	3
Element to Element Plate (two 20M Elements)				
BC1.25		1-1/4"	Black Polyamide clamps	6
	SH1420	2-3/4"	Socket Head Screw 1/4-20	12+2
	NN1420		Nylon Nut 1/4-20	12+2
Boom to Element Plate (two 20M Elements)				
BEC2.0-3i-5/8		2"	Boom to Element Plate clamp	3
	HH51618	3-1/2"	Hex Head Screw 5/16-18	6+1
	NN51618		Nylon Nut 5/16-18	6+1
BOOM TO 15M/10M ELEMENT ASSEMBLIES				
BEP-4		8-1/4" x 2-1/2"	Element Plate for 15M/10M	9
Element to Element Plate (four 15M Elements)				
BC1.0		1"	Black Polyamide clamps	8
	SH1420	1-3/4"	Socket Head Screw 1/4-20	16+2
	NN1420		Nylon Nut 1/4-20	16+2
Element to Element Plate (five 10M Elements)				
BC.75		3/4"	Black Polyamide clamps	10
	SH1420	1-3/4"	Socket Head Screw 1/4-20	20+2
	NN1420		Nylon Nut 1/4-20	20+2
Boom to Element Plate (four 15M Elements, five 10M Elements)				
BEC2.0-3i		2"	Boom to Element Plate clamp	9
	HH1420	3-1/2"	Hex Head Screw 1/4-20	18+2
	NN1420		Nylon Nut 1/4-20	18+2
20M ELEMENT ASSEMBLIES (3 Elements)				
AT1.25-20M-REF-D1		REF & D1 Center	72" Alum Tube 1.25" OD	2
AT1.25-20M-DRV		DRV Center	36" Alum Tube 1.25" OD	2
AT1.125-Doubler		DRV	18” Doubler Alum Tube 1.125”OD	2
AT1.125-20M			24” Alum Tube 1.125”OD	6
AT1.0-20M			18" Alum Tube 1.0" OD	6
AT.875-20M			24" Alum Tube .875" OD	6
AT.75-20M			24" Alum Tube .75" OD	6
AT.625-20M			36" Alum Tube .625" OD	6

AT.5-20M		36" Alum Tube .5" OD	6
AT.375-20M-REF	REF Tips	43" Alum Tube .375" OD	2
AT.375-20M-DRV	DRV Tips	35.5" Alum Tube .375" OD	2
AT.375-20M-D1	D1 Tips	10" Alum Tube .375" OD	2
20M Element Hardware			
SH1024-1	1-1/2"	Socket Head Screw 10-24	12+2
NN1024		Nylon Nut 10-24	12+2
SH832-2	1-1/4"	Socket Head Screw 8-32	12+2
SH832-1	1"	Socket Head Screw 8-32	6+2
NN832		Nylon Nut 8-32	18+2
SH632	3/4"	Socket Head Screw 6-32	12+2
NN632		Nylon Nut 6-32	12+2
20M Driven Element Hardware			
FG1.0DE	1" OD	Fiberglass Rod for Driven Element	1
BH1024	3"	Button Head Screw 10-24	2+1
KN1024		Keps Nut 10-24	2+1
15M ELEMENT ASSEMBLIES (4 Elements)			
AT1.0-15M-REF-D1-D2	REF-D1-D2 Center	18" Alum Tube 1" OD	3
AT1.0-15M-DRV	DRV Center	9" Alum Tube 1" OD	2
AT.875-15M		24" Alum Tube .875" OD	8
AT.75-15M		24" Alum Tube .75" OD	8
AT.625-15M		36" Alum Tube .625" OD	8
AT.5-15M		36" Alum Tube .5" OD	8
AT.375-15M-REF	REF Tips	29" Alum Tube .375" OD	2
AT.375-15M-DRV	DRV Tips	29-1/4" Alum Tube .375" OD	2
AT.375-15M-D1	D1 Tips	20-3/8" Alum Tube .375" OD	2
AT.375-15M-D2	D2 Tips	20-1/2" Alum Tube .375" OD	2
15M Element Hardware			
SH832-2	1-1/4"	Socket Head Screw 8-32	16+2
SH832-1	1"	Socket Head Screw 8-32	8+2
NN832		Nylon Nut 8-32	24+2
SH632	3/4"	Socket Head Screw 6-32	16+2
NN632		Nylon Nut 6-32	16+2
15M Driven Element Hardware			
FG.875DE	.875" OD	Fiberglass Rod for Driven Element	1
BH1024	2-1/2"	Button Head Screw 10-24	2+1
KN1024		Keps Nut 10-24	2+1
10M ELEMENT ASSEMBLIES (5 Elements)			
AT.75-10M-DRV	DRV Center	18" Alum Tube .75" OD	2
AT.75-10M-REF-D1-2-3	REF-D1-D2-D3 Center	36" Alum Tube .75" OD	4
AT.625-10M		36" Alum Tube .625" OD	10
AT.5-10M		36" Alum Tube .5" OD	10
AT.375-10M-REF	REF Tips	28" Alum Tube .375" OD	2

AT.375-10M-DRV		DRV Tips	22" Alum Tube .375" OD	2
AT.375-10M-D1		D1 Tips	20-1/2” Alum Tube .375" OD	2
AT.375-10M-D2		D2 Tips	20-3/8" Alum Tube .375" OD	2
AT.375-10M-D3		D3 Tips	18-1/4" Alum Tube .375" OD	2
10M Element Hardware				
	SH832-1	1"	Socket Head Screw 8-32	10+2
	NN832		Nylon Nut 8-32	10+2
	SH632	3/4"	Socket Head Screw 6-32	20+2
	NN632		Nylon Nut 6-32	20+2
10M Driven Element Hardware				
	FG.625DE	.625" OD	Fiberglass Rod for Driven Element	1
	BH1024	2-1/2"	Button Head Screw 10-24	2+1
	KN1024		Keps Nut 10-24	2+1
TRANSMISSION LINES/BALUN ASSEMBLY - Tribander Section (Balun not included)				
TL30			Aluminum Angle Bar	2
	AS-1	5/8"	Aluminum Spacer	2+2
	AS-2	1/2"	Aluminum Spacer	2+2
	LWExt10		Lock Washer External Tooth #10	4+1
	NN1024		Nylon Nut 1024	6+2
TL1.5			Aluminum "L" Bracket for Balun	2
	NN1024		Nylon Nut 1024	2+1
	AS-2	1/2”	Aluminum Spacer	2+2
	AS-3	3/8”	Aluminum Spacer	2+2
	AS-4	1/4"	Aluminum Spacer	2+2
SUPPLIES				
Penetrox	(OPTIONAL)		Anti-Oxidant	1