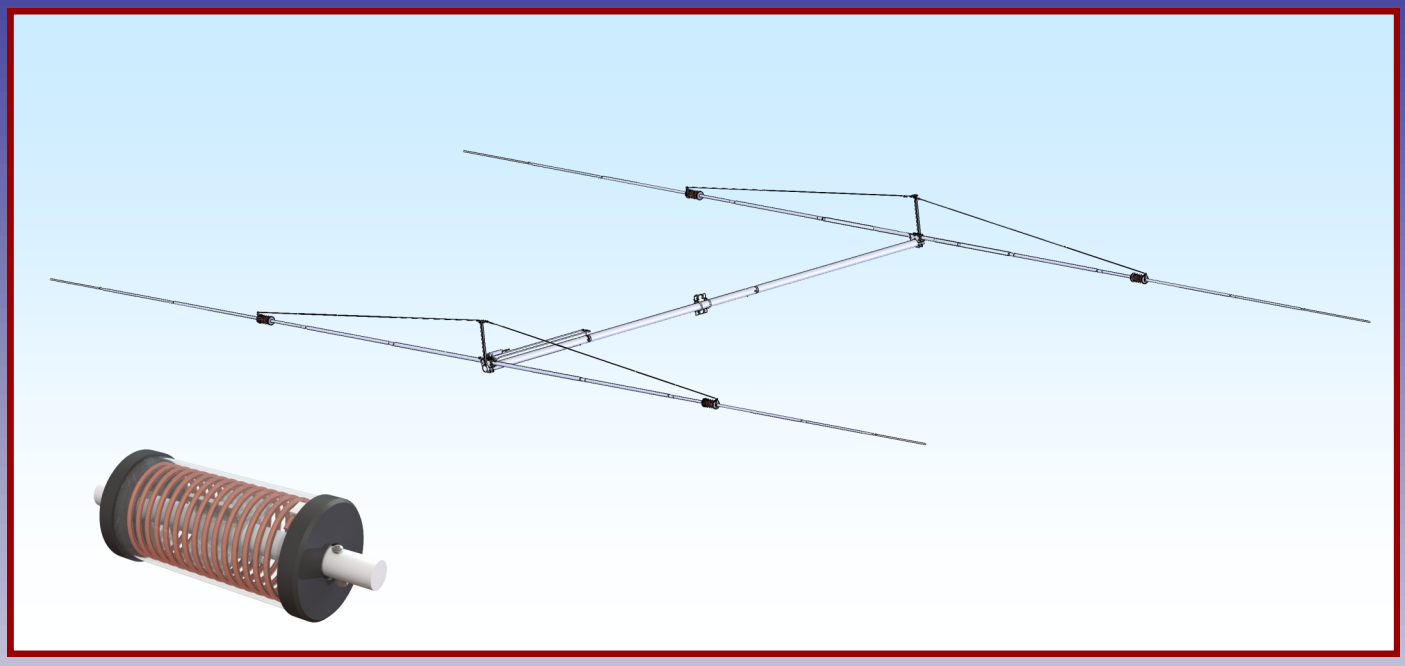
M2 Antenna Systems, Inc.
Model No: 40M2C



SPECIFICATIONS:

Model	40M2C
Frequency Range	7.0-7.3 MHz 3 Seg
Gain	11 dBi @ 70' / 6.1 FS
Front to back	25 dB @ 70 ft / 15 FS
Beamwidth	E=74°
Feed type	Hair pin match
Feed Impedance.	50 Ohms Unbalanced
Maximum VSWR	See Curve
Input Connector	SO-239, Other avl.

Power Handling	3 Kw PEP, Higher avl.
Boom Length / Dia	19.5' / 3.0 x .065 Wall
Element Length / Dia.	50 Ft. / 1-1/2" To 1/2"
Turning Radius:	27 Ft.
Stacking Distance	70 Ft.
Mast Size	2" to 3 " Nom.
Wind area / Survival	4.85 Sq. Ft. / 100 MPH
Weight / Ship Wt.	76 Lbs. / Lbs.

***Subtract 2.14 from dBi for dBd**

FEATURES:

The 40M2C is the latest addition to our already exceptional 40 meter Yagi lineup. Using all the latest design and manufacturing tools, including 3D printed coil forms. Our coil loaded antennas now make it difficult to choose a full size equivalent. Mounting this Yagi at 70 feet creates incredibly clean pattern with unique front to rear and above performance.

Our new covered coil design features 3/16" diameter copper clad soft drawn aluminum that has great power handling and high efficiency (Q over 900) combined with low weight. We use 3D printing for precision coil forms. The coils are located at the optimum place in each element half. The location of the coil is important for best performance and this careful placement also breaks the element into small electrical lengths that appear shorter than 20 meter elements. This means there is little or no interaction with any 20 meter Yagi on the same mast OR on the same boom. Our new DUAL BAND "CYCLE BUSTER " takes full advantage of this unique feature.

Mechanically, the coil loading offers a cleaner look with less wind area and fewer connections. Wind and ice loading are reduced as well. We continue to offer the same unbreakable element mounting and OVER HEAD element support. The rugged, time tested elements and 3 kW 1:1 Balun are part of the package. All Hardware is stainless steel except for the Galvanized U-bolts and saddles. (Stainless U-bolts tend to Gall and freeze up) and used in our other 40M Yagis.

M2 Antenna Systems, Inc. 4402 N. Selland Ave. Fresno, CA 93722
Tel: (559) 432-8873 Fax: (559) 432-3059 Web: www.m2inc.com

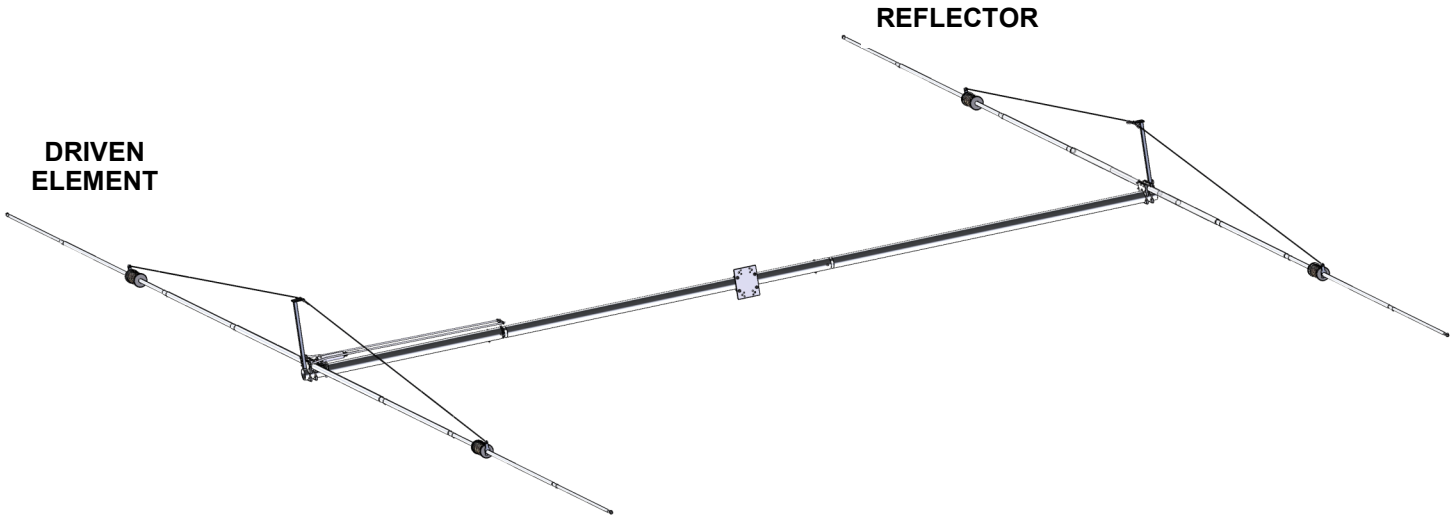
05/017/21
Rev.01

40M2C ANTENNA OVERVIEW

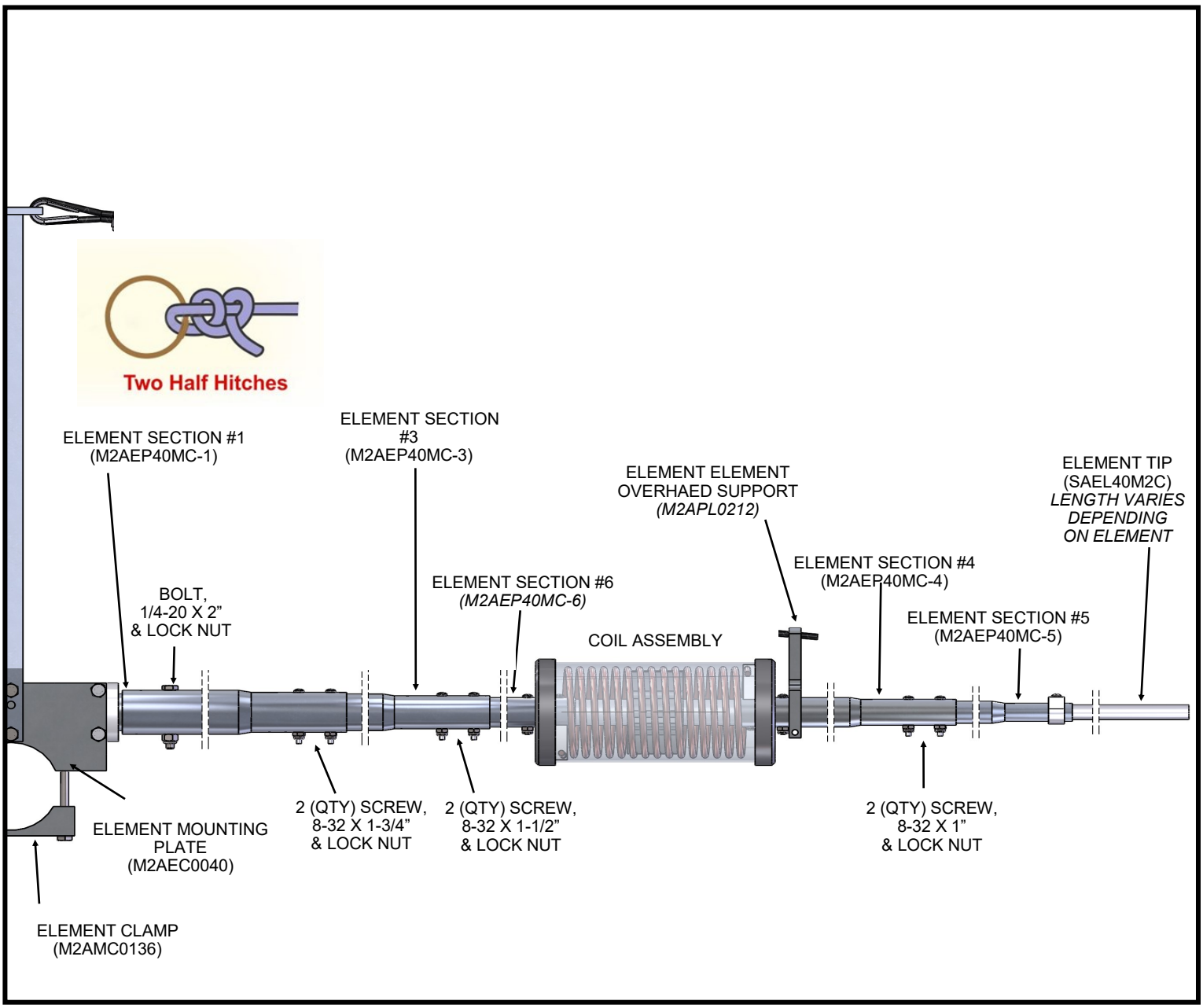
BEFORE YOU BEGIN: Look over all the DRAWINGS to get familiar with the various parts and assemblies in the system. Tools handy for assembly process: screwdriver, 11/32”, 7/16”, 1/2”, 9/16” and 5/8” spin-tites, end wrenches and/or sockets, and a measuring tape.

Note:
All installations are unique in some way, which means it's OK to preassemble certain hardware, or rearrange the assembly process to meet specific site requirements. A quick review of the assembly drawings should help firm up the appropriate strategy. Please remember to double-check all hardware for tightness BEFORE it becomes inaccessible.

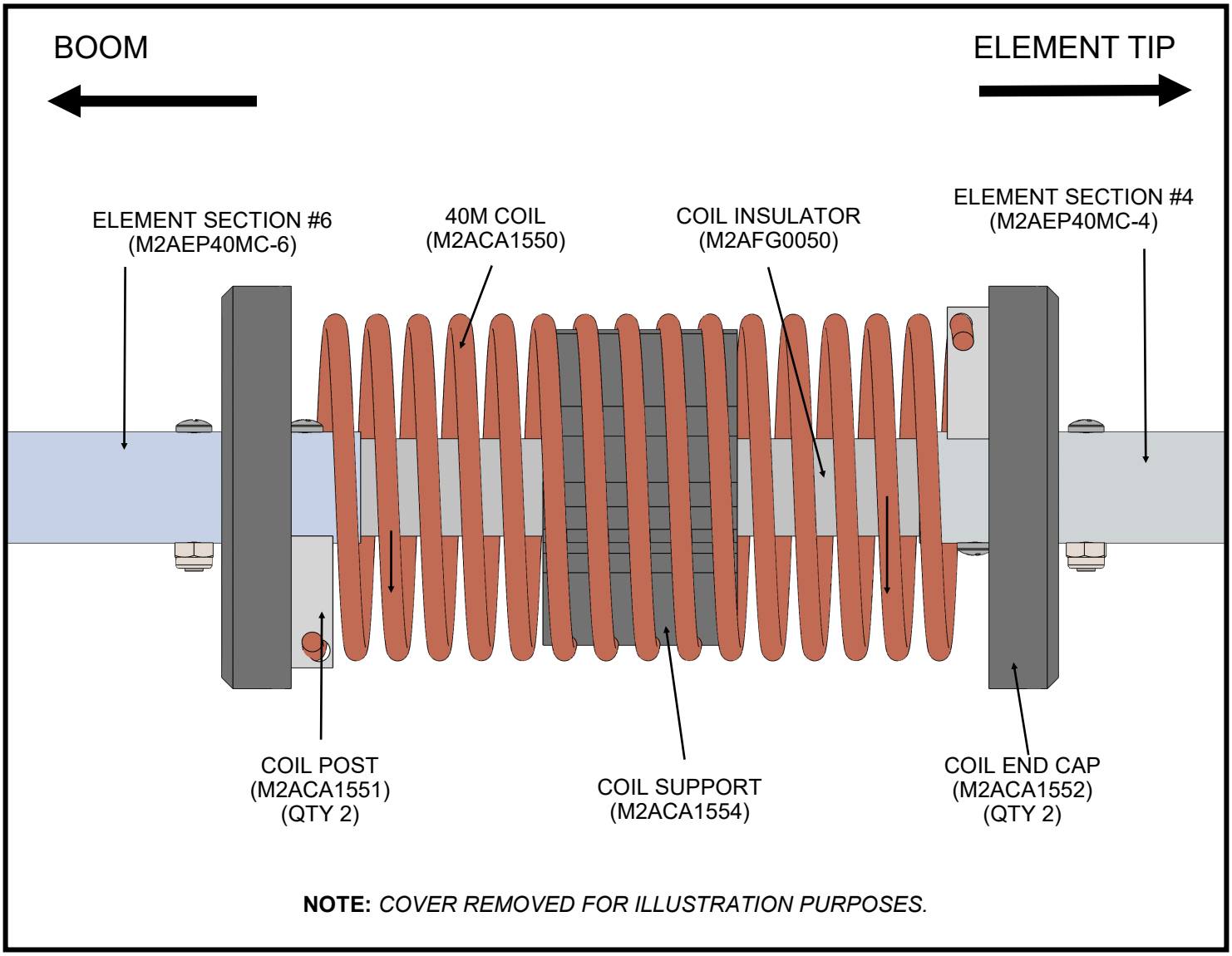
One container of zinc paste (Penetrox, Noalox, or equiv.) has been provided to enhance and maintain the quality of all mechanical and electrical junctions on this system. Apply a thin coat wherever two pieces of aluminum come in contact or any other electrical connections are made. It is also useful on screws and bolt threads as an ANTI SEIZE compound.



40M ELEMENT HALF OVERVIEW



40M COIL OVERVIEW



NOTE: *COVER REMOVED FOR ILLUSTRATION PURPOSES.*

40M COIL ASSEMBLY INSTRUCTIONS

STEP 1:

The coil comes wound tight with 16 total turns from the factory, **When final assembled, you will end with 15.5 total turns.** The excess material will be trimmed off after the coil is in its final position. Using a permanent marker, draw a straight line from one end of the coil to the other. This will help later to determine if your coil has grown in diameter during assembly. After final positioning of the coil, no more 3/4 of an inch of line tilt is allowed. A larger coil will cause the inductance to change which can cause your antenna to be off frequency.

STEP 2:

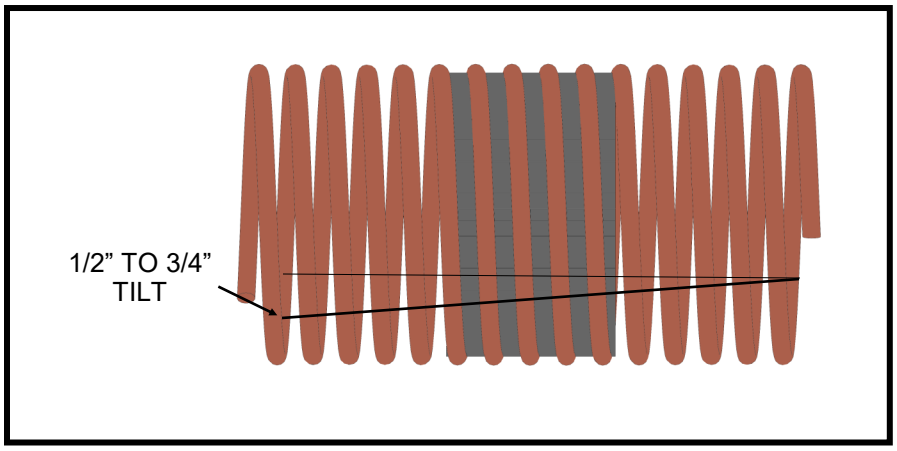
The COIL is wound tight at the factory to prevent damage during shipping. Use the COIL SPREADING TOOL provided, and carefully insert it into the first turn of the COIL. Now gently push or roll the tool through all 16 turns of the COIL. Now the COIL is nearly in its final shape and is ready to be threaded onto the COIL SUPPORT. Note the reference line drawn earlier, it will have a slight tilt after spreading.

STEP 3:

On one end, use pliers to gently straighten the last 1/2" of the COIL and file off any burrs.

STEP 4:

Begin threading the COIL onto one end of the COIL SUPPORT. **BE CAREFUL** to not deform the COIL during this process. The COIL should thread smoothly. Continue until about 5-1/2 turns are past the COIL SUPPORT or close to the center. Exact centering is not important. Again, note your reference line.



NOTE: *PENETROX PASTE FOR LUBRICATING SCREW THREADS AND TUBING JOINTS HAS BEEN SUPPLIED. USE A VERY SMALL AMOUNT ON EACH SCREW THREAD AND UNDER THE COIL POSTS DURING THE NEXT OPERATION.*

STEP 5:

Insert the COIL INSULATOR (M2AFG0050) into your COIL SUPPORT (M2ACA1554). Rotate the COIL and the COIL SUPPORT so the leading end of the COIL goes over and just past the inner hole in the COIL INSULATOR. Now slide on one COIL POST on to one end of the COIL so it is right over the first hole. Next, carefully slide on the ELEMENT SECTION #6 (M2AEP40MC-6) and align it so both holes in the tube match the two holes in the COIL INSULATOR.

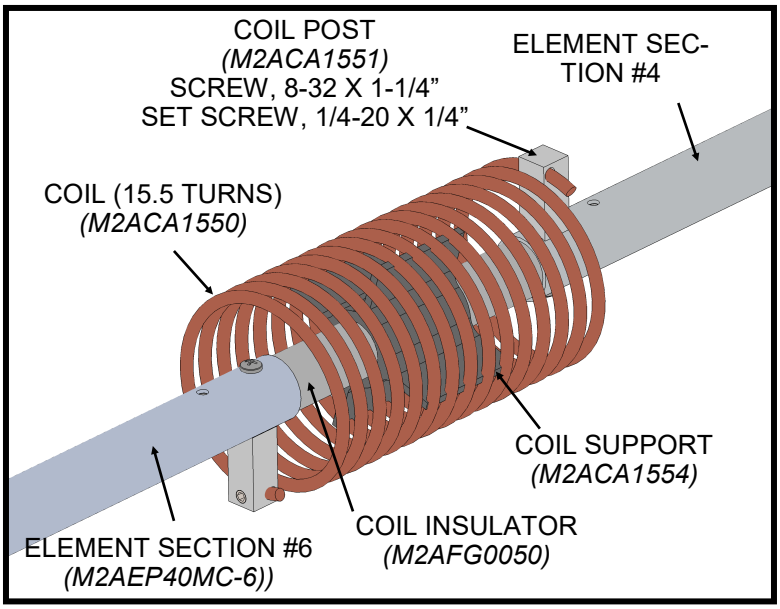
STEP 6:

Insert hardware through the ELEMENT SECTION #6 and the COIL INSULATOR and begin threading it into the COIL POST. Tighten hardware. Thread the SET SCREW into the top of the COIL POST and with about 1/2" of wire protruding past the COIL POST, tighten the SET SCREW gently. Use supplied ALLEN WRENCH to tighten the SET SCREW.

40M COIL ASSEMBLY INSTRUCTIONS

STEP 7:

The second COIL POST is mounted on the OPPOSITE SIDE of the COIL INSULATOR so 15 1/2 turns of the COIL are used. The extra 1/2 turn COIL should pass over the COIL INSULATOR hole. Slide on the second COIL POST and align it over the hole. Slide on ELEMENT SECTION #4 (M2AEP40MC-4) and fasten the COIL POST to the tubing assembling using the supplied hardware. Use you reference line and adjust the coil so the line has no more tilt the 3/4". There should be about 1.5 to 2" of extra coil material past the post after adjusting that will be trimmed.

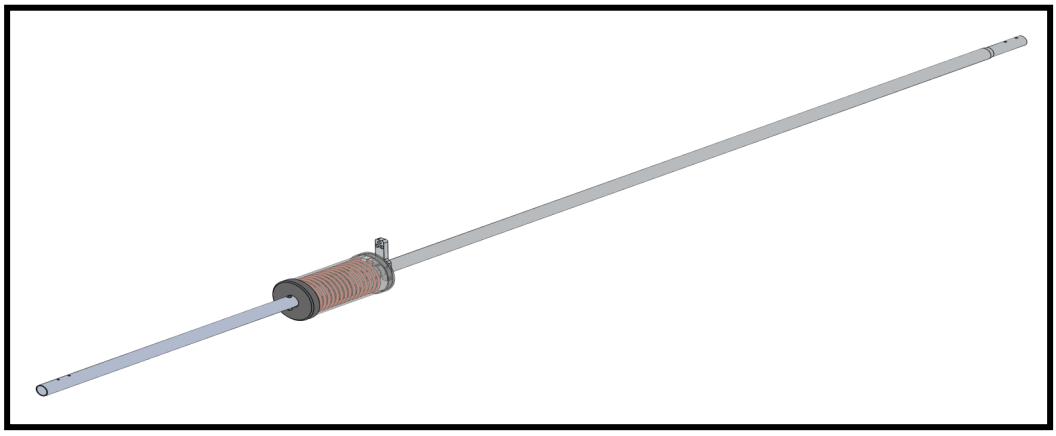


STEP 8:

Insert the SET SCREW into the COIL POST and tighten gently. Adjust the COIL and COIL SUPPORT location for equally spaced turns. The distance between each turn should be the same as the COIL wire diameter. Once the COIL is straight and aligned, tighten the final SET SCREW securely. Trim off excess coil material leaving 1/4 to 1/2" past the COIL POSTS.

STEP 9:

Slide COIL COVER and COIL END CAPS onto COIL ASSEMBLY. Secure COIL END CAPS into position by securing hardware through TUBE ASSEMBLIES on both ends of the COIL ASSEMBLY. Slide ELEMENT OVERHEAD SUPPORT onto ELEMENT SECTION until it reaches the head of the screw holding on the COIL COVER. Clamp ELEMENT OVERHEAD SUPPORT in place with screw and locknut.



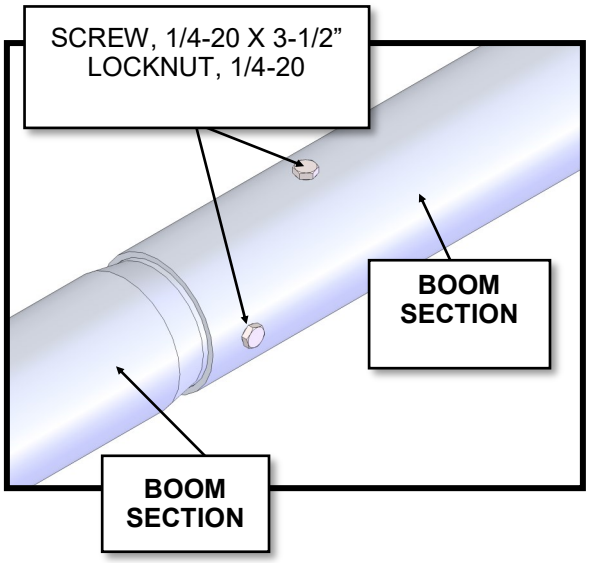
STEP 10:

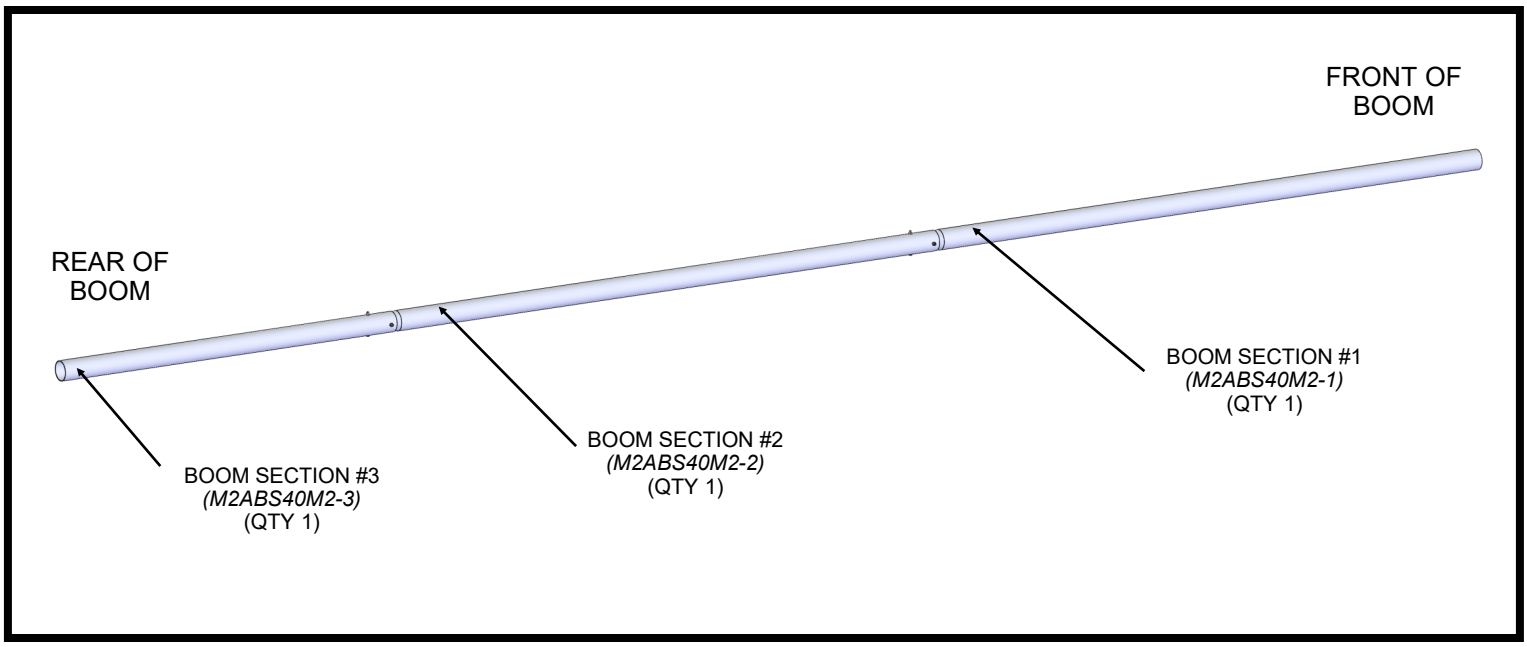
Assemble all the remaining COIL ASSEMBLIES by repeating steps 1-9. Set COIL ASSEMBLIES aside for future use.

40M2C BOOM ASSEMBLY INSTRUCTIONS

STEP 11:

At this point it will be helpful to perform the remaining assembly steps with the BOOM ASSEMBLY elevated off the ground (about 3 feet). This can be accomplished by using sawhorses or something similar. Wipe off the swedged ends of each BOOM SECTION and apply a small amount of PENTROX. Refer to the drawing below and assemble BOOM SECTIONS as shown. Insert hardware and tighten.

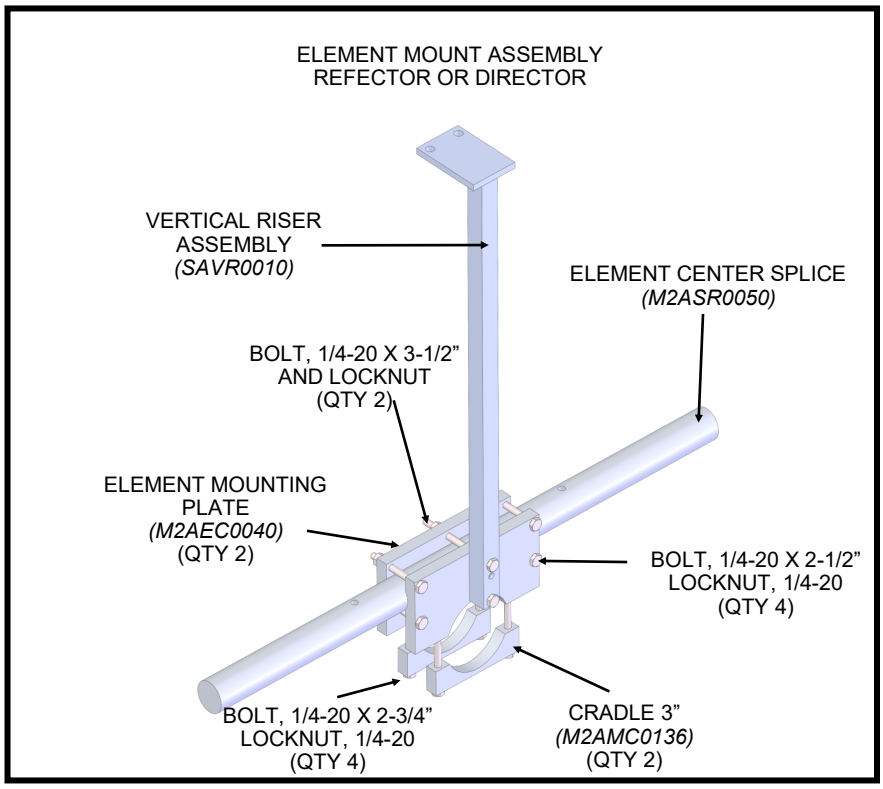




40M2C ELEMENT MOUNT ASSEMBLY INSTRUCTIONS

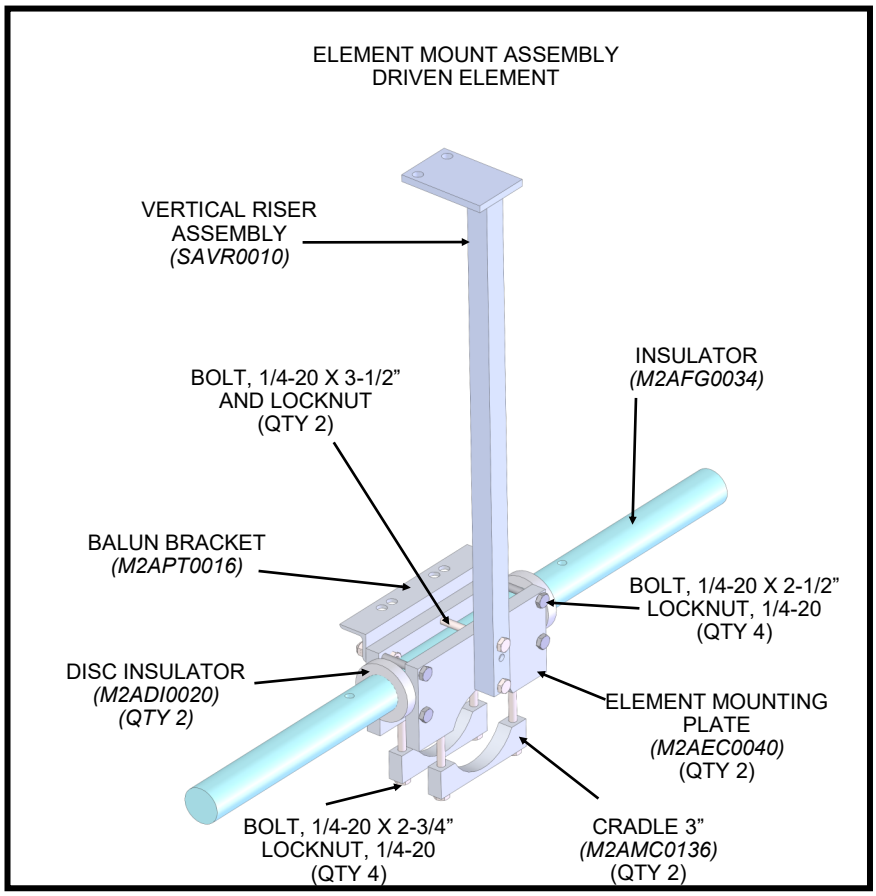
STEP 12:

Assemble the ELEMENT MOUNT assemblies for the reflector and front director element. Refer to the assembly drawing to aid in assembly. Be sure to center the ELEMENT CENTER SPLICE and the holes are in the vertical position.



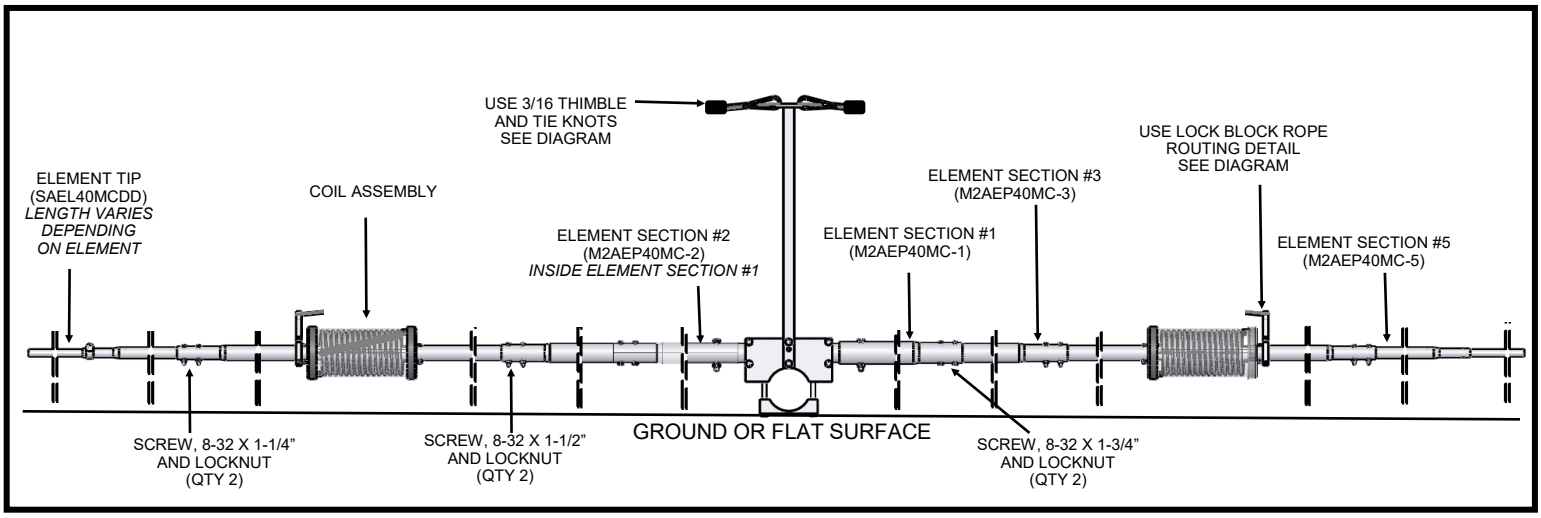
STEP 13:

Assemble the DRIVEN ELEMENT MOUNT assembly for the DRIVEN ELEMENT. Refer to the assembly drawing to aid in assembly. Be sure to center the INSULATOR and the hole are in the vertical position. The DISC INSULATORS are a press fit. Heating them with a heat gun or hot water will help in assembly.



NOTE: For the final assembly on all the elements, it is best to perform the next steps on the ground or long flat surface. This will aid during

40M2C ELEMENT FINAL ASSEMBLY INSTRUCTIONS



final adjustment of the ELEMENT OVER HEAD SUPPORT. *The ELEMENT HALVES are symmetrical on both sides. Do each of the following steps on both sides of the ELEMENT.*

STEP 14:

Slide ELEMENT SECTION #2 onto ELEMENT CENTER SPLICE or INSULATOR.

STEP 15:

Slide ELEMENT SECTION #1 onto ELEMENT SECTION #2. Insert hardware and tighten locknut. Attach VERTICAL RISER ASSEMBLY. For the driven element you need to add (4) CLAMP BLK, 3/8 (HAIRPIN) (M2AMC0261) and hardware. See drawings for hardware call out for the different elements.

STEP 16:

Insert ELEMENT SECTION #3 into the end of ELEMENT SECTION #1. Insert and tighten hardware.

STEP 17:

Insert the ELEMENT SECTION #6 of the COIL ASSEMBLY previous assembled in STEPS 1-10 into ELEMENT SECTION #3. Insert and tighten hardware.

STEP 18:

Insert ELEMENT SECTION #5 into the end of ELEMENT SECTION #4. Insert and tighten hardware.

STEP 19:

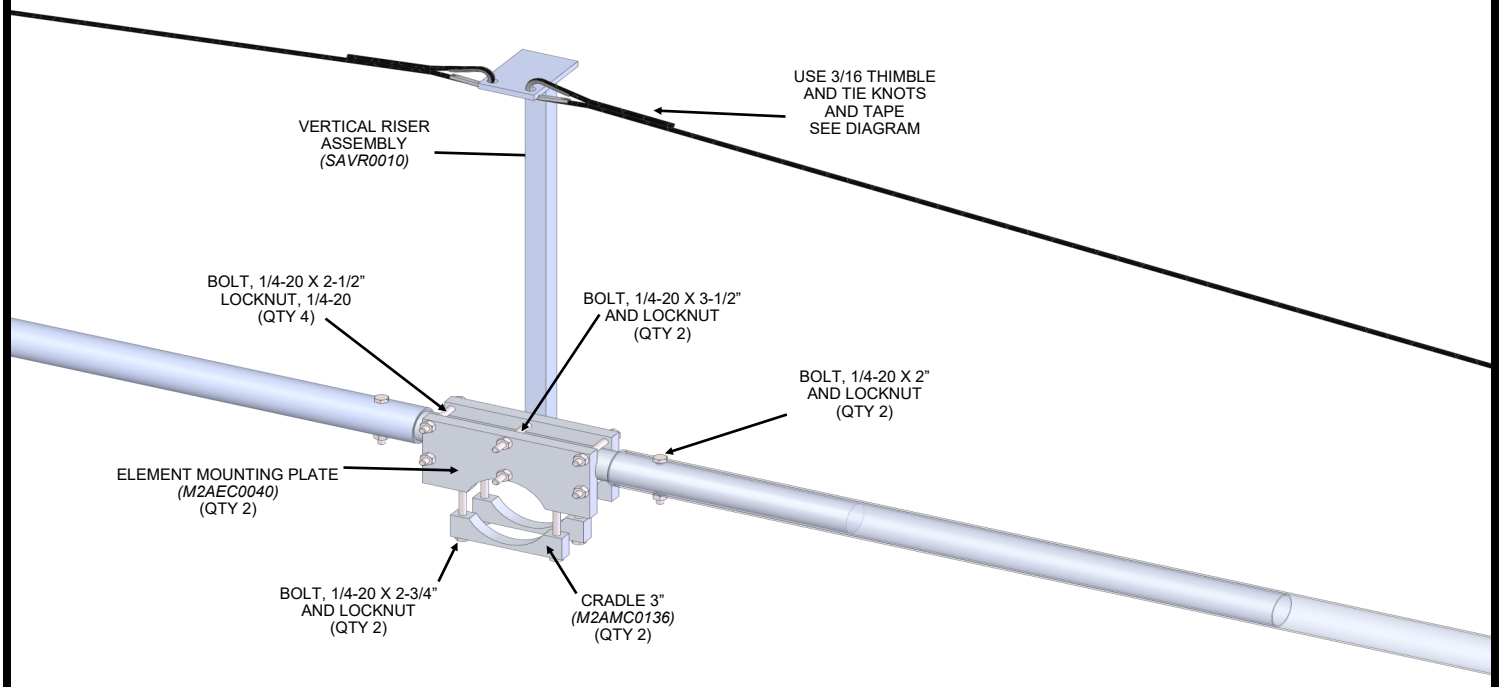
To be able to adjust the ELEMENT TIP, a COMPRESSION CLAMP is used. First thread on the hex nut to capture the screw in the CLAMP. Then slide the COMPRESSION CLAMP such the screw is lined up with the hole in ELEMENT SECTION #5. Use the DIMENSION SHEET and set the proper exposed length of the 1/2" ELEMENT TIP for the appropriate element, then mark the element assembly to avoid confusion later. See GENERIC COMPRESSION CLAMP DETAIL page for more detail.

STEP 20:

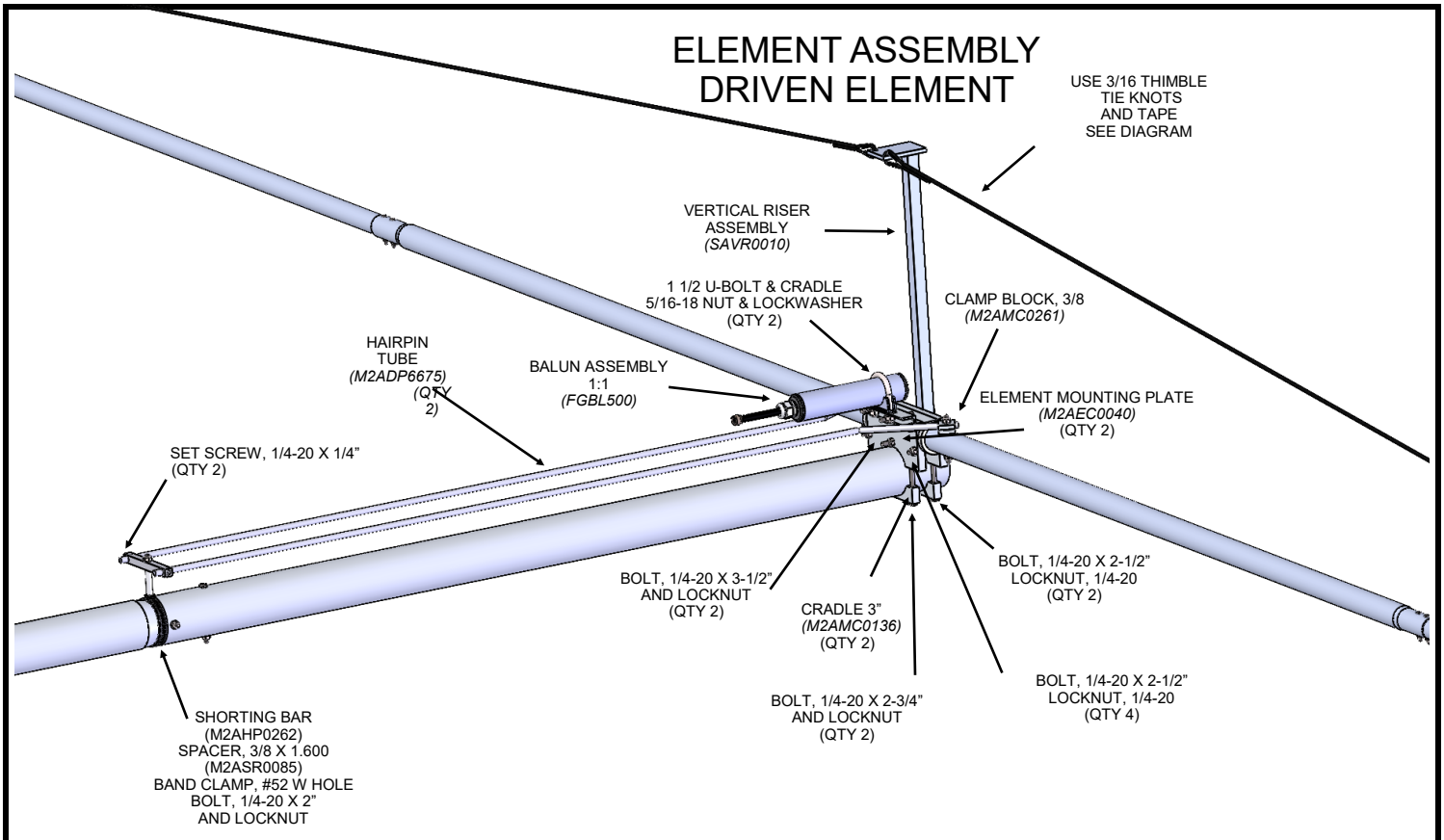
Tensioning the element over head guys: See the LOCK BLOCK AND KNOT DETAIL page. Familiarize yourself with knots at the top of VERTICAL RISER, bend the thimbles open and insert them into the holes on the top plate of the VERTICAL RISER, then bend them back to there original shape. Follow the knot diagram and tie the upper section of rope, leave no more than 3" of excess rope and finalize by taping the short tail of rope down to the main portion of rope. Thread the opposite end of the rope through the ELEMENT OVERHEAD SUPPORT (M2APL0212) (See the LOCK BLOCK AND KNOT DETAIL page) and tension the rope so the element is in a level or neutral position. It is always best to have the element in a level or neutral position or with a slight sag downward. Over tensioning can lead to a bowed element. This finalizes the element construction.

40M2C ASSEMBLY DETAIL

ELEMENT ASSEMBLY
REFLECTOR OR DIRECTOR
ELEMENT



ELEMENT ASSEMBLY
DRIVEN ELEMENT



40M2C HAIR PIN AND BALUN ASSEMBLY INSTRUCTIONS

STEP 21:

Refer to the dimension sheet for element placement. With the boom elevated on sawhorses or equivalent, using a long tape measure and a permanent marker lay the boom out by marking the centers of each element. Equalize the amount of extra boom at both ends on the antenna.

STEP 22:

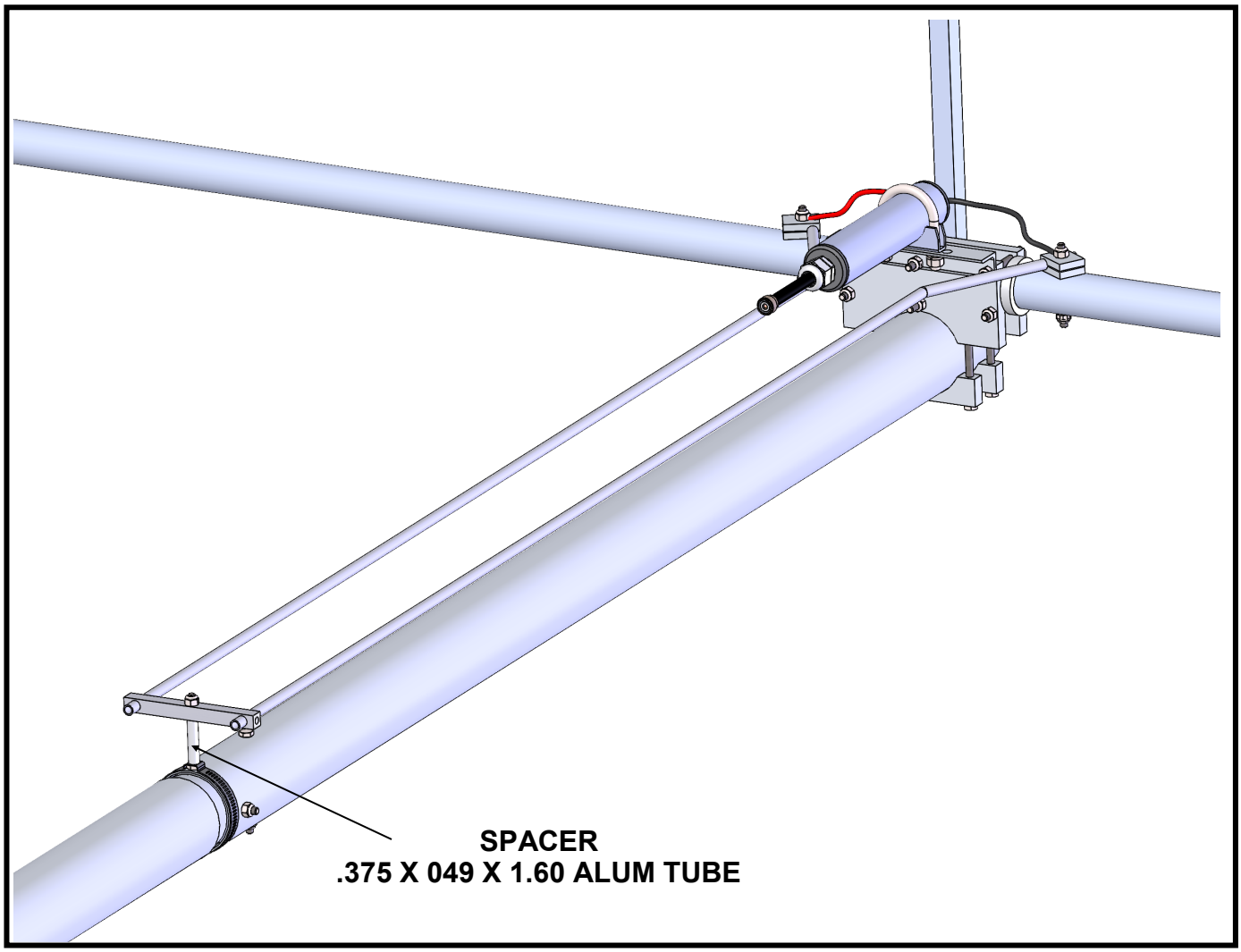
Install each element at the marks on the boom. Be sure the eye bolts in each end of the boom are in the up position. Double check the positions of each element and lightly tighten.

STEP 23:

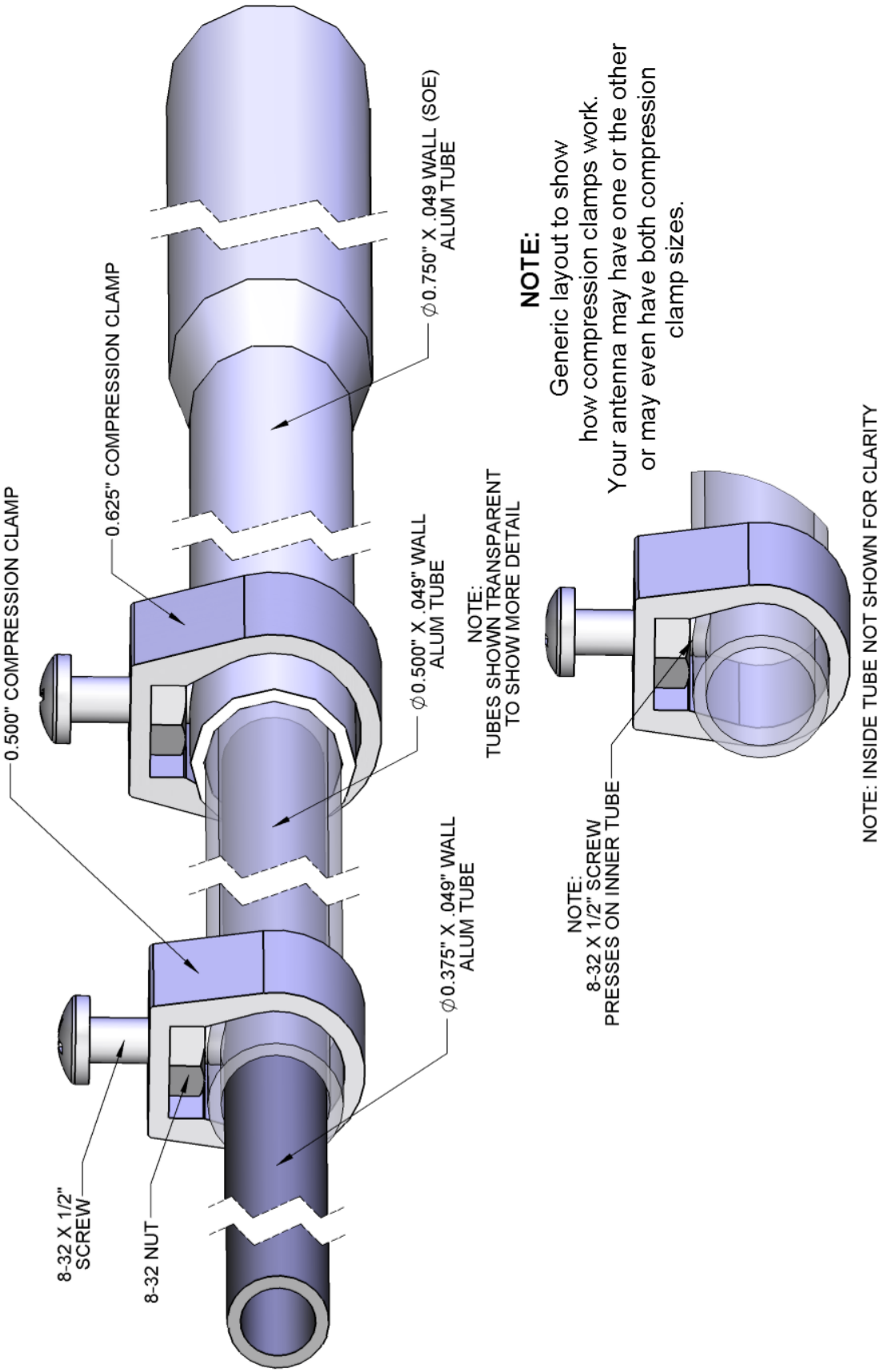
Standing at one end of the antenna, sight down the boom and reference each element to one another making sure each element is parallel to one another, make small adjustments as needed and tighten.

STEP 24:

Assemble the BALUN and feed system of the antenna. Refer to the dimension sheet and DRIVEN ELEMENT detail



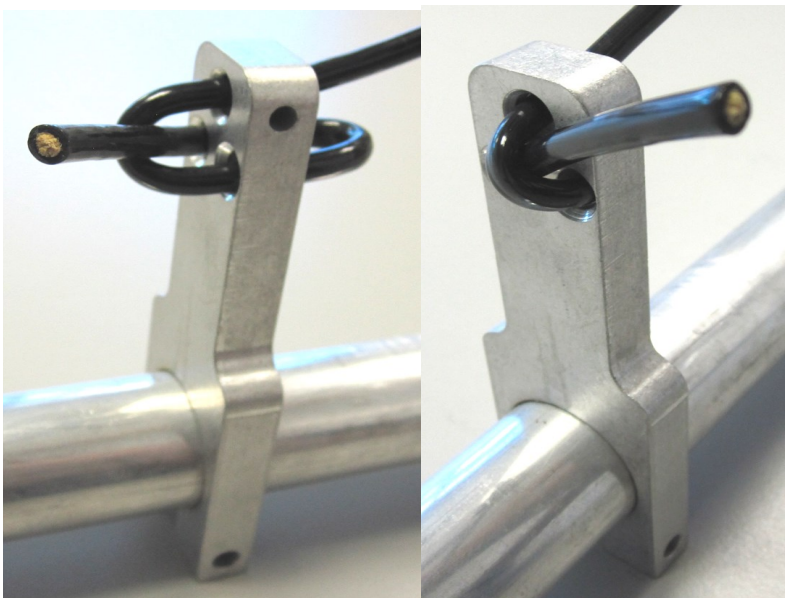
GENERIC COMPRESSION CLAMP DETAIL



NOTE:
Generic layout to show how compression clamps work. Your antenna may have one or the other or may even have both compression clamp sizes.

LOCK BLOCK AND KNOT DETAIL

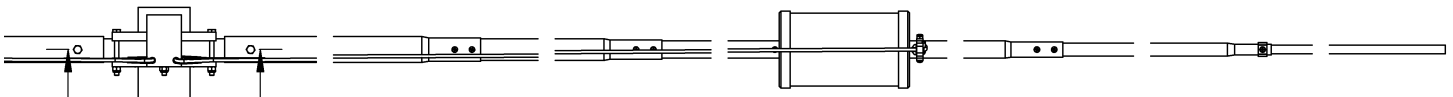
LOCK BLOCK ROPE ROUT DETAIL

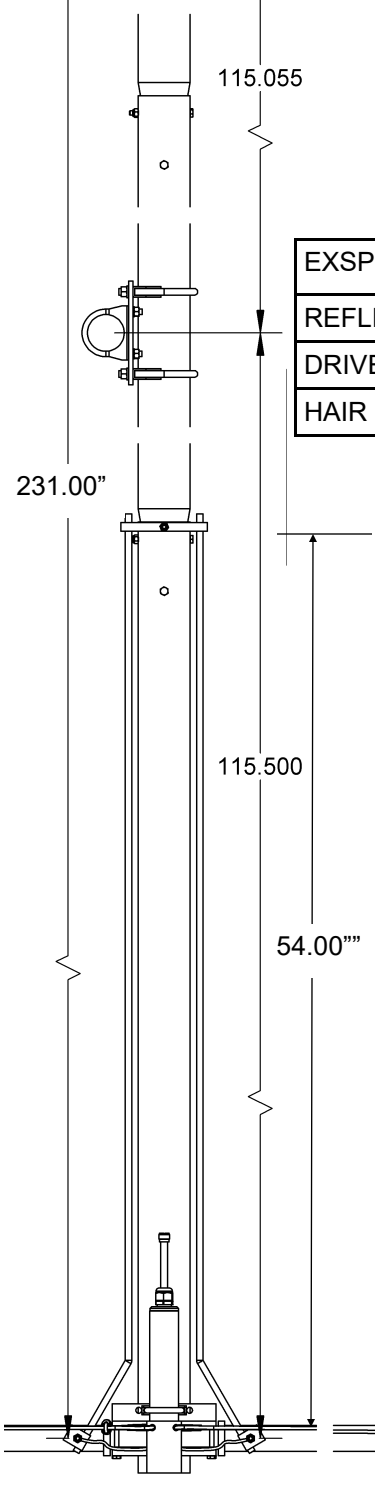


After final adjustments of knots and lock blocks, use electrical tape to tape the excess rope down to the main rope as prevention for rope slippage.

M2 40M2C DIMENSION SHEET

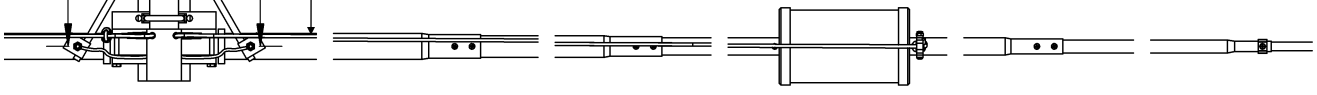
REFLECTOR ELEMENT





TUNING CHART

EXSPOSED ELEMENT TIP	7.00 TO 7.100 MHZ	7.100 TO 7.230 MHZ	7.160 TO 7.300 MHZ
REFLECTOR TIP	52.00”	46.50”	44.50”
DRIVEN ELEMENT TIP	41.50”	36.25”	33.50”
HAIR PIN POSITION	54.00”	54.00”	54.00”



DRIVEN ELEMENT

40M2C PARTS & HARDWARE

DESCRIPTION	QTY
BOOM SECTION #1, 3.0” X .065” X 95”, SOE (M2ABS40M2-1)	1
BOOM SECTION #2, 3.0” X .065” X 95” SOE (M2ABS40M2-2)	1
BOOM SECTION #3, 3.0” X .065” X 55” (M2ABS40M2-3)	1
ELEMENT SECTION #1: 1-1/2” X .058” X 60”, SOE (M2AEP40MC-1)	4
ELEMENT SECTION #2: 1-3/8” X .058” X 23.812” (M2AEP40MC-2)	4
ELEMENT SECTION #3: 1-1/4” X .058” X 60”, SOE (M2AEP40MC-3)	4
ELEMENT SECTION #4: 1” X .058” X 24”, (M2AEP40MC-6)	4
ELEMENT SECTION #5: 1” X .058” X 60”, SOE (M2AEP40MC-4)	4
ELEMENT SECTION #6: 3/4” X .049” X 48”, ALUMINUM SOE (M2AEP40MC-5)	4
ELEMENT TIP ASSEMBLY, 1/2” X .049” X SEE DIMENSION SHEET	4
ELEMENT CENTER SPLICE, 1.25” X 24”, ALUMINUM ROD (M2ASR0050)	1
INSULATOR, 1.25” X 24”, FIBERGLASS ROD (M2AFG0034)	1
ELEMENT MOUNTING PLATE, 3” X 6” X .500”, ALUMINUM (M2AEC0040)	4
CRADLE 3”, 1” X 4” X .500”, ALUMINUM (M2AMC0136)	4
DISC INSULATOR, POLYETHYLENE, 2” OD (M2ADI0020)	2
HAIR PIN TUBE, 3/8 X .049 X 55” BENT(M2ADP0605)	2
BALUN, 1:1 (FGBL500)	1
VERTICAL RISER ASSEMBLY (SAVR0010)	2
ELEMENT OVERHEAD SUPPORT, 1.250” X 3.750” X .375”, ALUMINUM (M2APL0212)	4
DACRON ROPE, 3/16 X 28’	2
BOOM TO MAST PLATE, 6” X 8” X 3/16”, ALUMINUM (M2APT0081)	1
PENETROX / ZINC PASTE CUP	1
ASSEMBLY MANUAL	1
BAG #1 - 40M	
40M COIL, 15 1/2 TURNS (M2ACA1550)	4
COIL POST, .500” X .500” X 1.187”, ALUMINUM (M2ACA1551)	8
COIL END CAP, 4.465” X .625”, UMHW (M2ACA1559.A)	8
COIL COVER, 4.210” X 7.250”, PVC TUBE (M2ACA1560.A)	4
COIL SUPPORT, 2.937” X 1.75”, POLYETHYLENE (M2ACA1554)	4
COIL INSULATOR, .875” X 10.625”, FIBERGLASS (M2AFG0050)	4
COIL SPREADING TOOL, 5/8” X 2”, DELRIN (M2ACA1558)	1
BAG #2	
3” U-BOLT & CRADLE	2
2” U-BOLT & CRADLE, HEAVY DUTY	4
1-1/2” U-BOLT & CRADLE	1
BAG #3	
THIMBLE, 3/16” LIGHT DUTY ZINC	4
COMPRESSION CLAMP, 5/8” (M2AMC0145)	4
CLAMP BLK, 3/8 (HAIRPIN) (M2AMC0261)	4
SHORTING BAR,1/2 X 5 (M2AHP0262)	1
SPACER, HF HAIR PIN, 3/8 X 1.600" ALUMINUM TUBE (M2ARS0085)	1
BAND CLAMP, #52 3” W/ HOLE	1
BALUN BRACKET 6”(M2APT0016)	1
BAG #4	
LOCK WASHER, 3/8”, SS (HWS03750150)	4
NUT, 3/8-16”, SS (HNT03750100)	4
LOCK WASHER, 5/16”, SS (HWS03120100)	10
NUT, 5/16-18, SS (HNT03120200)	10
BOLT, 1/4-20 X 3-1/2”, SS (HBT02500755)	4
BOLT, 1/4-20 X 2-3/4”, SS (HBT02500600)	8
BOLT, 1/4-20 X 2-1/2”, SS (HBT02500550)	11
BOLT, 1/4-20 X 2”, SS (HBT02500450)	2
SET SCREW, 1/4-20 X .250”, SS	10
LOCKNUT, 1/4-20, SS (HNT02500100)	16
BAG #5	
SCREW, 8-32 X 1-3/4”, SS (HSC00830850)	8
SCREW, 8-32 X 1-1/2”, SS (HSC00830800)	12
SCREW, 8-32 X 1-1/4”, SS (HSC00830700)	16
SCREW, 8-32 X 1/2”, SS (HSC00830400)	4
NUT, 8-32, SS (HNT00830100)	4
LOCKNUT, 8-32, SS (HNT00830150)	36
ALLEN HEAD WRENCH, 1/8”	1