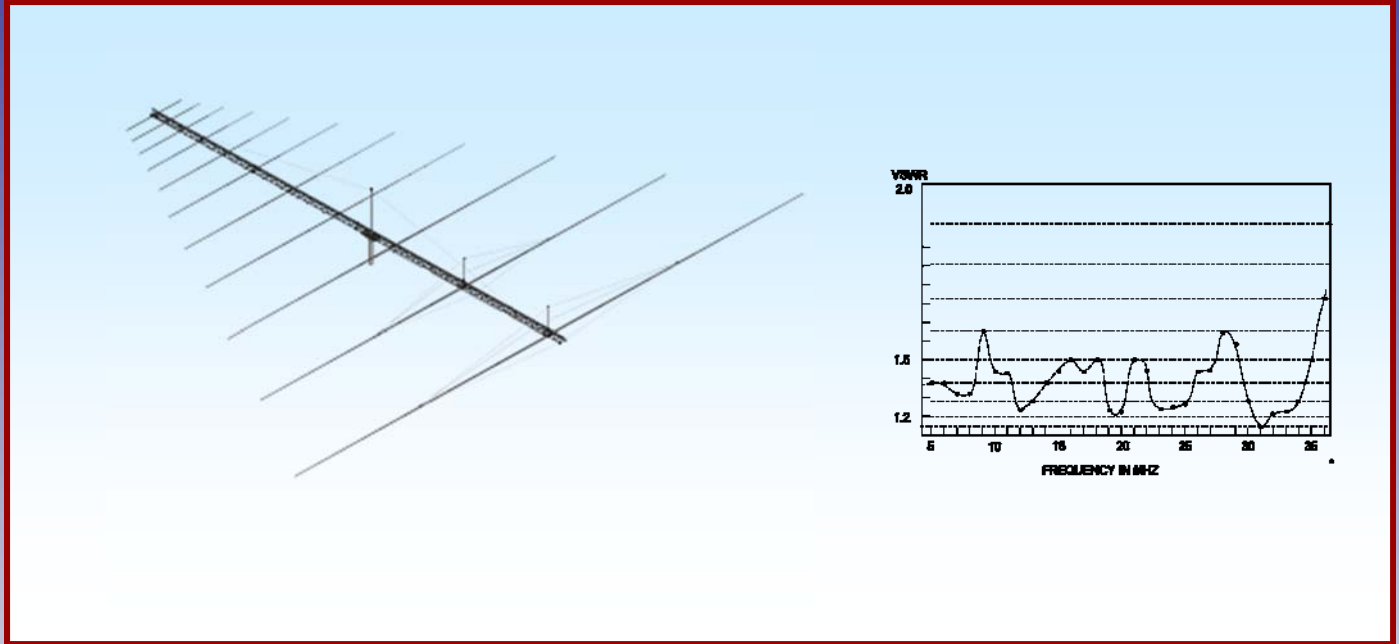




M2 Antenna Systems, Inc. Model No: 6-30LP11



SPECIFICATIONS:

Model	6-30LP11	Input Connector	"N" Female
Frequency Range.....	6 To 30 MHz	Power Handling	3 Kw, Higher Optional
*Gain	5 To 6.2 dBi	Boom Length / Type	80' / Steel Tower
Front to back	10 To 20 dB Typical	Turning Radius:	65'
Feed Impedance.	50 Ohms Unbalanced	Wind area / Survival	125 MPH
Maximum VSWR.....	1.8:1 Max, Under 1.5	Weight / Ship Wt.....	1,228 Lbs.

***Subtract 2.14 from dBi for dBd**

FEATURES:

The 6-30lp11 log periodic is a modern design both mechanically and electrically. Top quality materials combined with many CNC machined parts will keep it trouble free for years of operation. Performance is excellent and specific path gain can be as much as 12 dB with ground gain factored in. The 6-30LP11 is available individually or in a turnkey system, complete with support tower, rotation mechanism and controller. Many options exist within the turnkey system such as height and type of tower, rotator mechanism, and controller type. As pictured above and originally supplied to NASA at Edwards air Force Base in Edwards California, the tower was a special, massive, motorized, self supporting 72 foot tower supplied by US tower Corp to M² specifications. The 6-30LP11 is the latest Log to join the M² Family of high quality broad band antennas.

6-30LP11 ASSEMBLY MANUAL

BEFORE YOU BEGIN: Look over the ELEMENT ASSEMBLY sheets to get familiar with the various parts of the log periodic. These written instructions attempt to give some order and efficiency to the overall assembly and make you aware of critical areas. TWO CUPS OF ZINC PASTE HAS BEEN PROVIDED AND SHOULD BE USED AT EACH JOINT WHERE MACHINED PARTS JOIN ALUMINUM RODS OR TUBES AND GENERALLY AT EACH ELECTRICAL CONNECTION POINT. **WE ALSO STRONGLY RECOMMEND THAT EACH BOLT AND SCREW USED, BE TOUCHED IN THIS PASTE WITH THE FIRST FEW THREADS. THIS WILL PREVENT GAULING AND BETTER TIGHTENING OF THE STAINLESS HARDWARE.**

THIS IS A VERY LARGE ANTENNA WHEN COMPLETELY ASSEMBLED. WE SUGGEST YOU ASSEMBLE THE ELEMENTS FIRST AND WHEN DOING THE LARGER ELEMENTS, ASSEMBLE THE TIP SECTIONS UP TO THE 1-1/2" SECTIONS, MARK AND SET ASIDE UNTIL THE BOOM IS ASSEMBLED AND THE INNER SECTIONS 2" DIAMETER AND LARGER ARE MOUNTED ON THE BOOM.

THE LONGEST 3 ELEMENTS ARE BOXED INDIVIDUALLY TO MAKE IT EASIER TO IDENTIFY AND ASSEMBLE THE CORRECT ELEMENT SECTIONS.

BEGIN ASSEMBLING THE SMALLEST ELEMENTS FIRST TO ESTABLISH A "ROUTINE"

REFER TO THE ELEMENT 4 THROUGH 11 ASSEMBLY SHEET

1. Locate five (5) 7/8 x 30" FIBERGLASS RODS and (10) POLY DISCS with 7/8" holes. Press a disc onto the end of a rod and slide it down until it is about 3/4" inside the INNER two 1/4" holes. Then slide another poly disc on from the other end of the rod and position it about 3/4" inside the other 1/4" hole. Repeat this for all five of the 7/8" FIBERGLASS RODS. Slight repositioning of the poly discs may be required when the element is mounted below the boom.

ELEMENT #11 (Smallest)

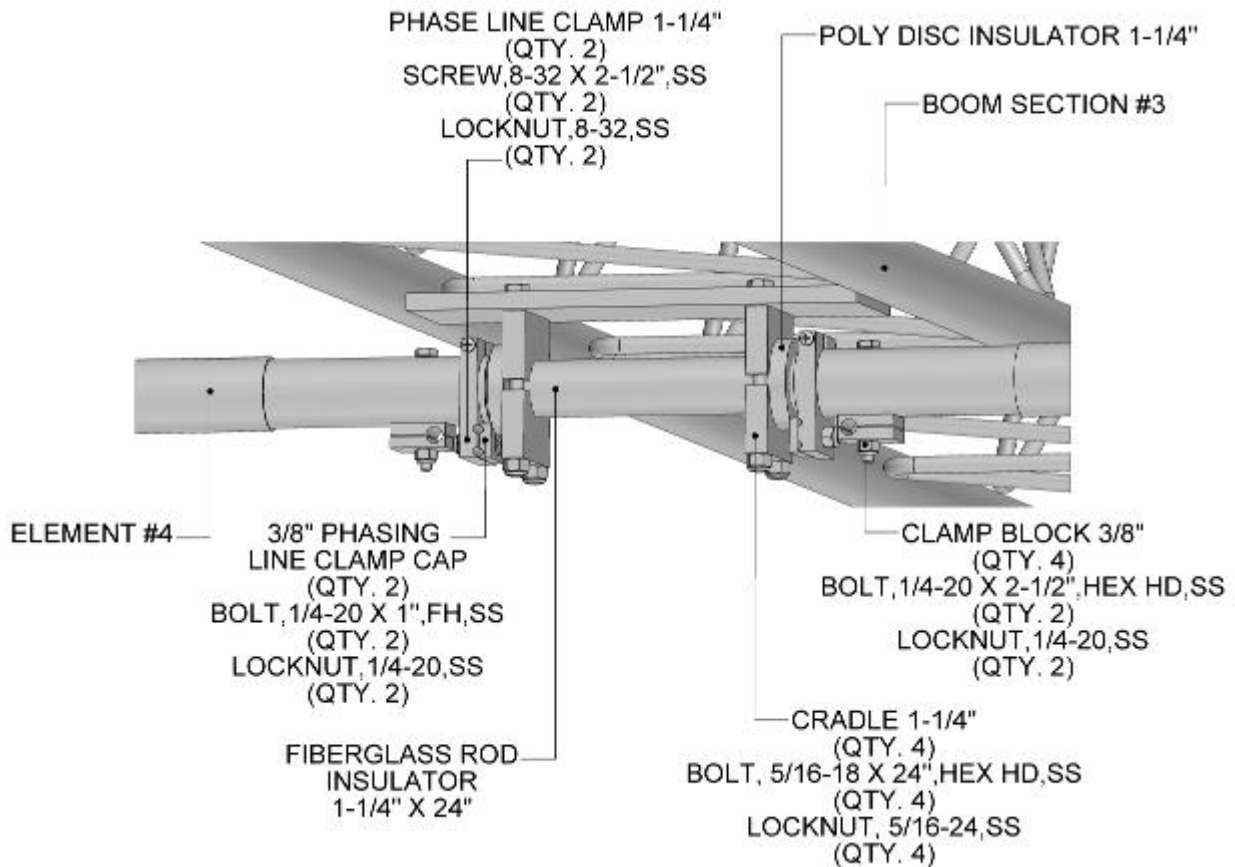
2. Install a PHASE LINE CLAMP with 1" hole at the butt of the 1" x 60.75" element half with the two grooves facing the butt. Secure the clamp block temporarily using an 8-32 x 1-1/2" screw and locknut. Add a PHASING LINE CLAMP CAP to the PHASE LINE CLAMP using a 1/4-20 x 1" flat head bolt and locknut, but finger tighten only at this time. Repeat for the other #11 element half. Now slide each element half onto a previously prepared 7/8" FIBERGLASS ROD and align the holes. Secure with 1/4-20 x 1-1/2" bolt and locknut. Finally, align the grooved side of the clamp block assembly on each side with the NUT SIDE of the bolt holding each element half onto the rod. Position the clamp blocks about 1/2" from the end of the element butts and tighten the 8-32 x 1-1/2" screws and locknuts securing the clamp blocks. Use a marking pen to identify the element as #11. Element #11 is now complete and ready to be installed on the boom at a later time.

ELEMENTS #10, #9, #8, & #7

3. These are very similar to #11. Follow the same procedure as in step #2. Follow the ELEMENT ASSEMBLY SHEET for the element information and the hardware needed. Don't forget to use PENETROX (ZINC) PASTE on all aluminum joints and on the threads of the screws and bolts. Element #7 has a 1-1/8" outer sleeve but it still uses a 7/8" FIBERGLASS ROD and a PHASE LINE CLAMP with 1" hole for the phasing lines.

6-30LP11 ASSEMBLY MANUAL

- Element #6 is similar as well but has internal sleeves to strengthen the element. It has a 1-1/4" diameter element butt and needs a 1" FIBERGLASS ROD, POLY DISCS with 1" hole and PHASE LINE CLAMPS with 1-1/4" hole.
- ELEMENT #5 is 1-1/2" diameter at the butt and needs a 1-1/4" FIBERGLASS ROD, POLY DISCS with 1-1/4" hole and PHASE LINE CLAMPS with 1-1/2" hole.
- ELEMENT #4 is similar to #5 but requires a 1-5/8" OUTSIDE SLEEVE over the butt section to maintain element strength to survive 125 mph winds. ELEMENT #4 is unique because at #4 there is transition in phasing line diameter. Both PHASE LINE CLAMPS AND 3/8" CLAMP BLOCK PAIRS are required at the butt of this element. The 3/8" diameter phasing lines go back to element #3.

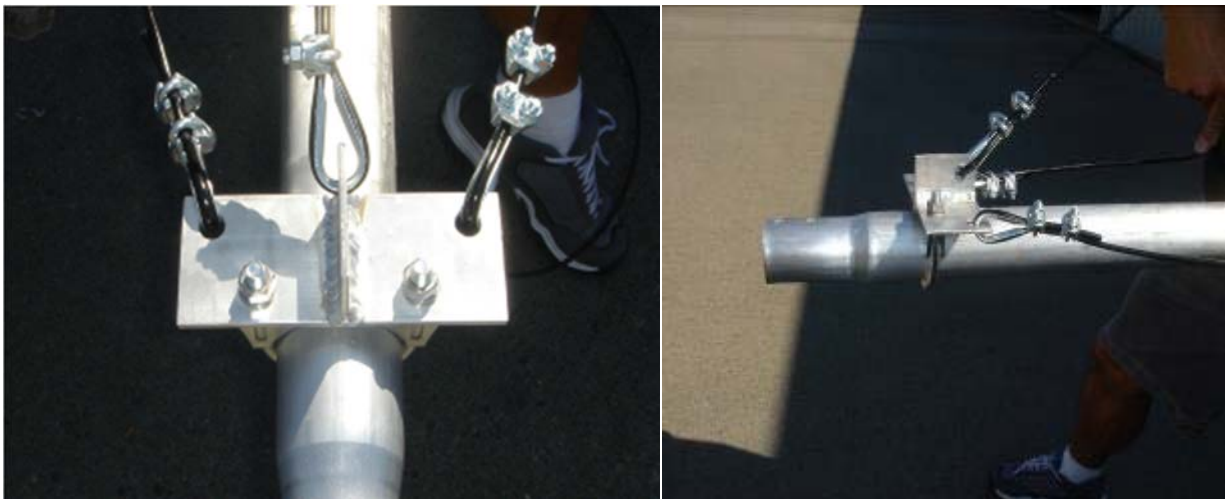


THIS COMPLETES ELEMENT ASSEMBLY FOR ELEMENTS #11
DOWN THROUGH ELEMENT #4

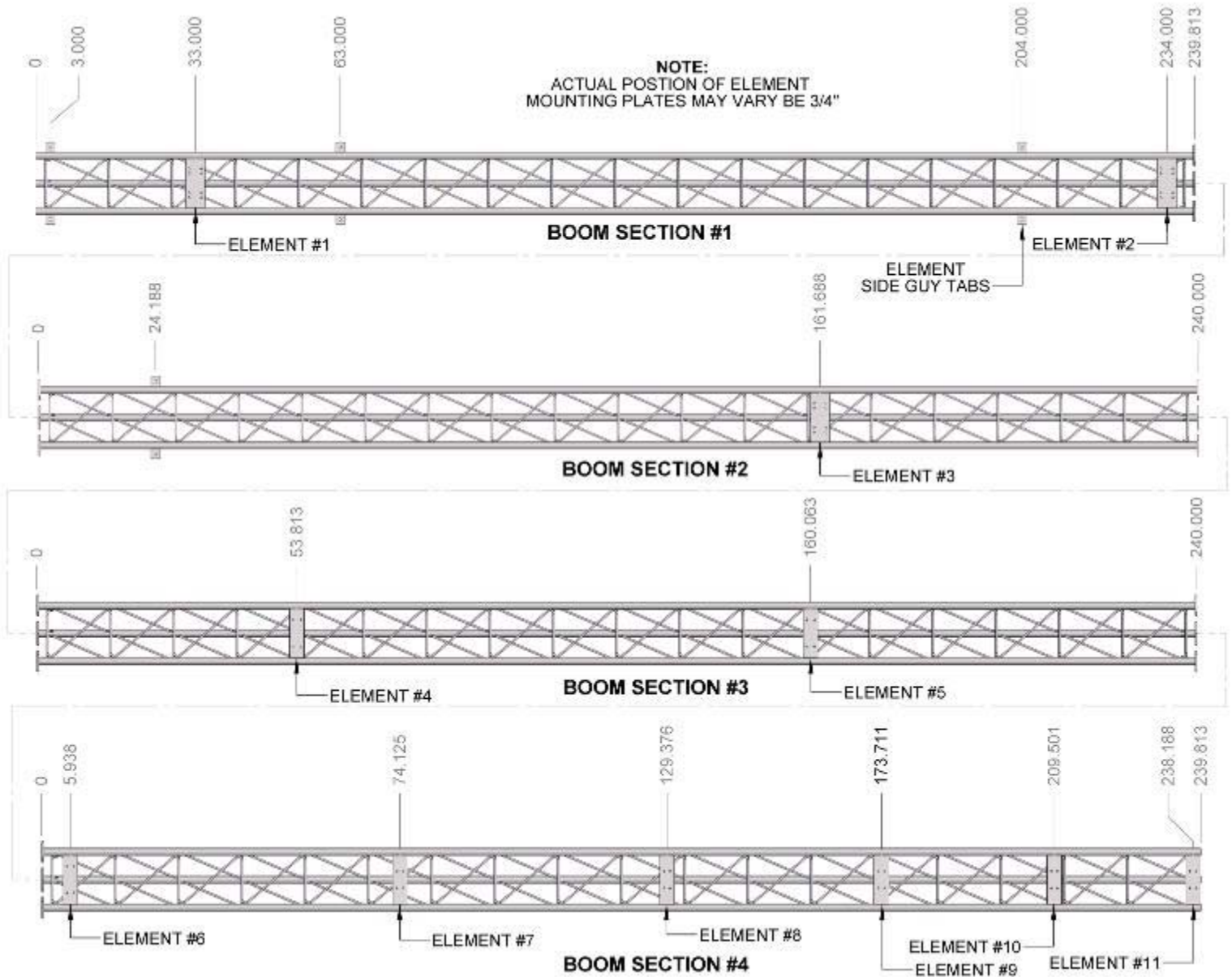
ELEMENTS #3, #2 AND #1 ARE NEXT AND WE RECOMMEND YOU ASSEMBLE THE OUTER SECTIONS BEGINNING WITH THE 1-1/2" SECTIONS, MARK THEM AND SET THEM ASIDE FOR LATER CONNECTION TO THEIR INNER SECTIONS.

6-30LP11 ASSEMBLY MANUAL

7. Assemble the three inner section of ELEMENT #3. NOTE that the PHASE LINE CLAMPS and PHASING LINE CLAMP CAPS have been replaced with pairs of 3/8" CLAMP BLOCKS held in place with the same bolt that keeps the element on the 2" FIBERGLASS ROD. These 3/8" CLAMP BLOCKS clamp the 3/8" diameter phasing lines installed later in the assembly. The POLY DISCS have 2" diameter holes to fit over the 2" center support insulator and may have been factory installed as have the machined coupling rings. If POLY DISCS have not been factory installed on CENTER SUPPORT INSULATOR you will have to remove two rings off one side, slide POLY DISCS on and re-install rings. **NOTE:** These POLY DISCS provide a long barrier between the "hot" element and the grounded tower boom. They provide arc and flashover protection in the event the insulator is contaminated with salt spray, bird doo or other foreign substances that could conduct under the right condition.
8. Assembling ELEMENT #2 & #1 is similar to #3 except ELEMENT #2 & #1 each use (2) ELEMENT SIDE SUPPORT BRACKETS that are attached to the 2" sections just inside the SWAGED (necked down) section. Use a 2" U-bolt and cradle and stainless nuts and lock washers. Attach (3) HPTG 1200 Philistran insulated cables to each of the three holes in ELEMENT SIDE SUPPORT BRACKET. Use a 3/16" cable eye in each hole. String two 1/8" cable clips on one end of each cable and thread the cable end through each hole and around each cable eye. Thread the cable end back through the cable clips about 3". Space the clips about 1" inch apart. Push one clip tight against the cable eye and begin tightening that clip. Straighten the cable between the clips and begin tightening the second clip. Alternate back and forth on the tightening of each clip until each is tight and the clips are secure. The other ends of these cable will be attached to the TOWER BOOM and ELEMENT VERTICAL SUPPORT MAST later in the assembly procedure.



6-30LP11 BOOM TOWERASSEMBLY

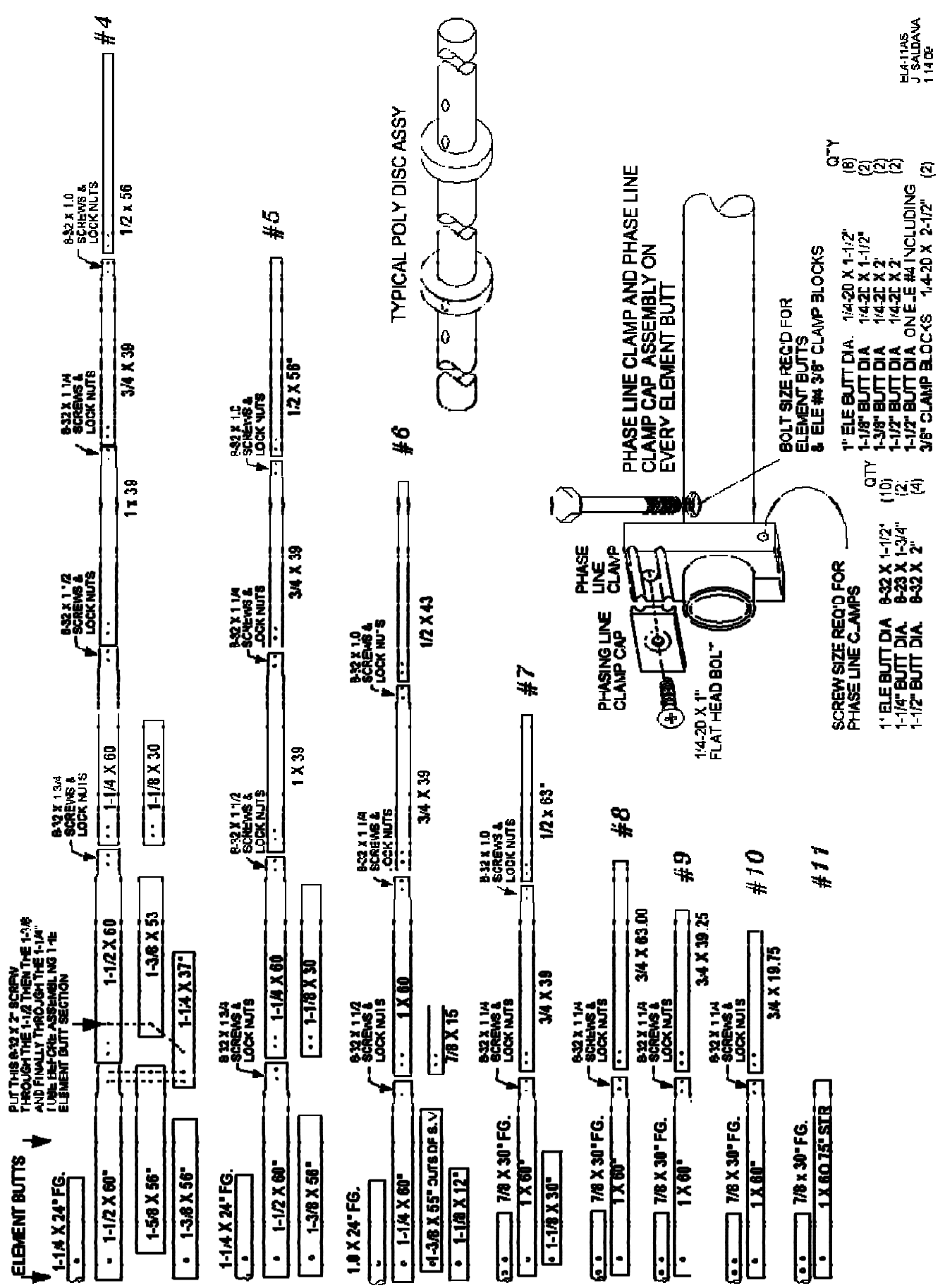


1. Use 1/2-13 X 2" (grade 5) galvanized bolts, 1/2-13 galvanized nut & 1/2-13 galvanized pal nut for all tower boom section joints.



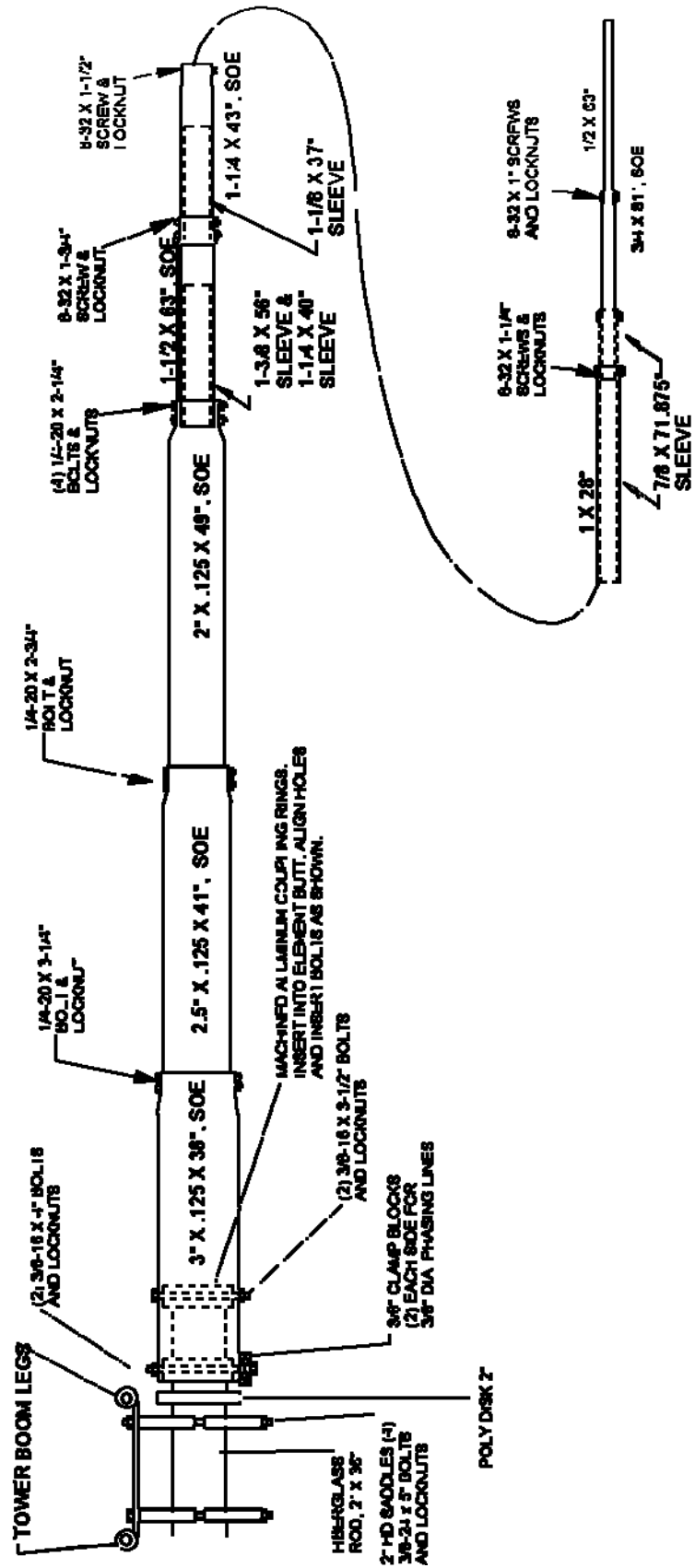
2. Shims (as shown) are supplied with tower sections to help align. Use as needed.

6-30LP11 ELEMENT ASSEMBLY #4-11

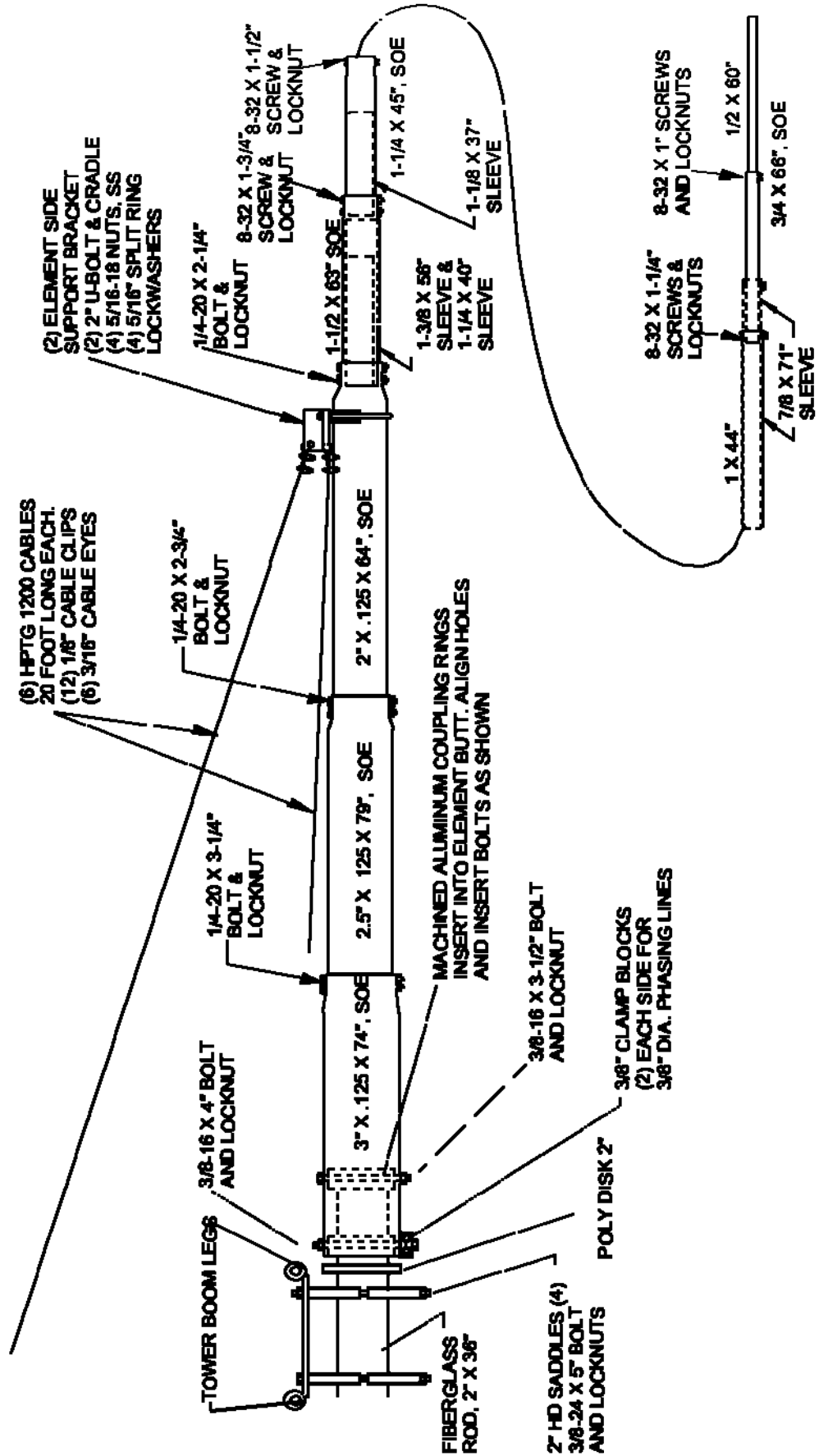


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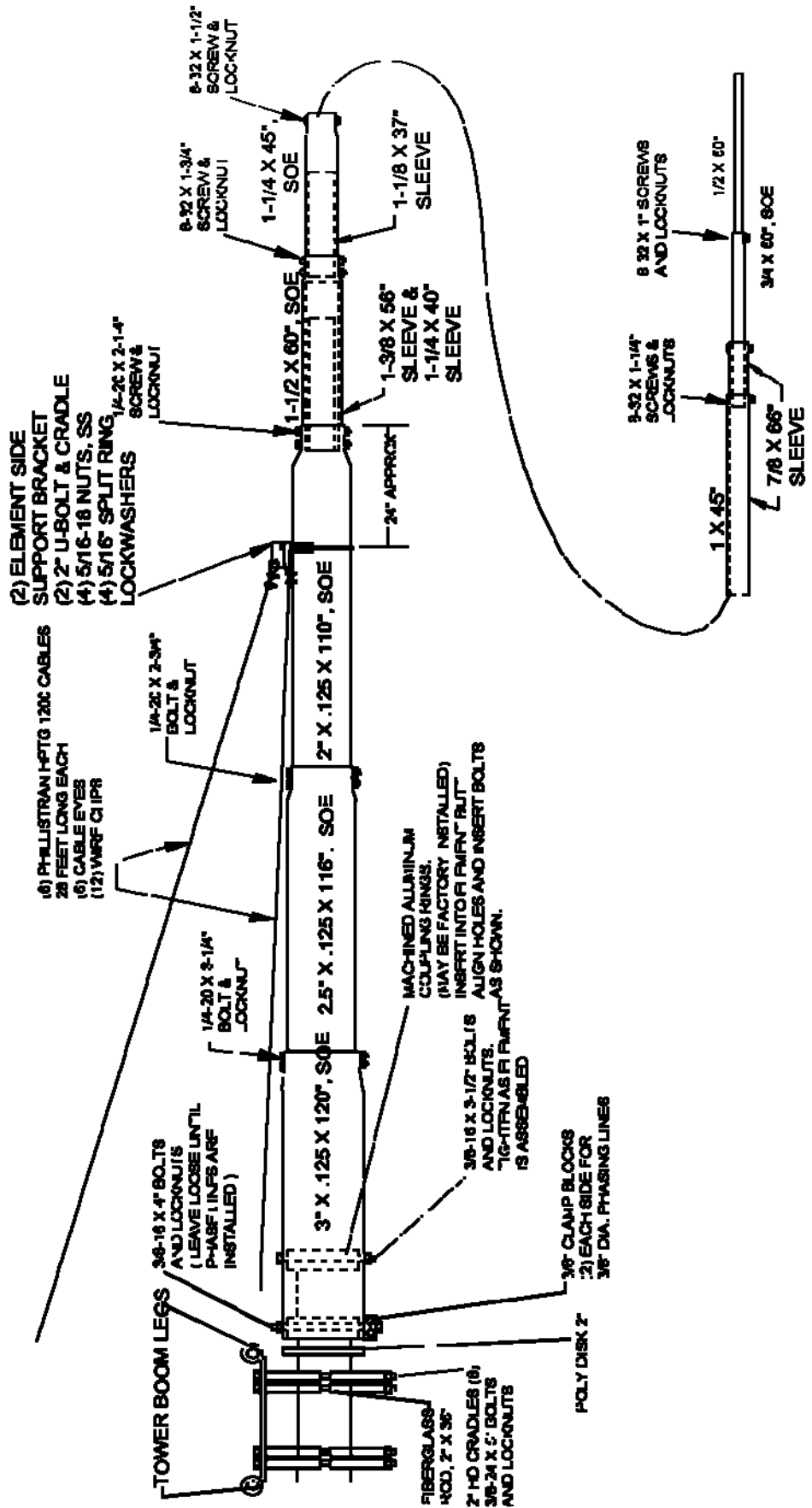
6-30LP11 ELEMENT ASSEMBLY #3



6-30LP11 ELEMENT ASSEMBLY #2



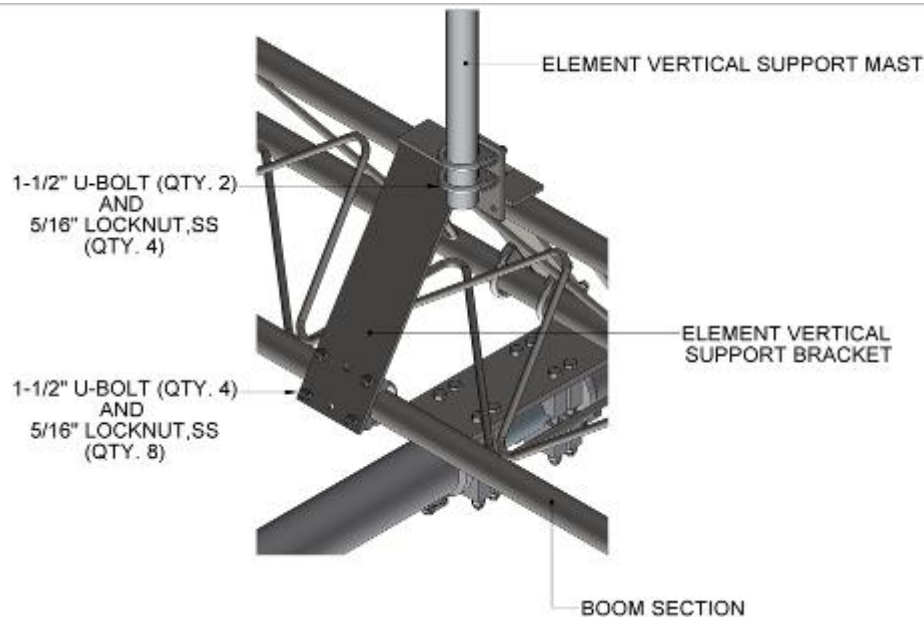
6-30LP11 ELEMENT ASSEMBLY #1



6-30LP11 ELEMENT INSTALLATION

1. Begin by installing element #11, the smallest element. Locate the bag of twenty (20) HD CRADLES with 7/8" radius to fit the 7/8" fiberglass rods. These cradles have clearance holes for 5/16" diameter bolts. Drop four (4) 5/16-24 x 4" bolts down through the element #11 mounting plate. Hold the center of element #11 up near the plate and place two saddles on the center of 7/8" fiberglass rod. Raise the element up and feed the bolts down through the cradles. Place another cradle under each upper cradle and add locknuts. Tighten up the nuts until the element is almost secure. Then center the element through the cradles and rotate the element until the bolts at the element butt are up and their corresponding nuts are down. Tighten the cradle bolts evenly and completely. Now orient the PHASE LINE CLAMP ASSEMBLIES on the element butts so the PHASING LINE CLAMP CAP are DOWN and square with the boom.
2. Continue mounting element #10, #9, #8, and #7 in order as described above.
3. Element #6 is different only as it has a 1" fiberglass rod and (4) HD CRADLES with 1" radius, fitting the fiberglass rod perfectly. Use (4) 5/16-24 x 4" bolts and locknuts to secure the element.
4. Element #5 and #4 both use 1-1/4" fiberglass rods and (4) HD CRADLES with 1-1/4" radius. Use 5/16-24 x 4-1/2" bolts and locknuts.
5. Because of their size and weight we have suggested that just the INNER SECTIONS of element #3, #2, and #1 be mounted before the whole element is assembled. Element #3 and #2 use 2" fiberglass rods and (4) HD CRADLE with 2" radius. These cradles require 3/8-24 x 5" bolts and locknuts. Before tightening cradles completely be sure to rotate the element so the 3/8" PHASE LINE CLAMP CAPS are down and their bolts are perfectly perpendicular with the TOWER BOOM legs. Doing this will facilitate the installation of the phasing lines in the subsequent assembly steps.
6. Element #1 uses a 2" fiberglass rod and (8) HD CRADLES with 2" radius. These cradles require (8) 3/8-24 x 5" bolts and locknuts. Again center and rotate the element in the cradles so the 3/8" PHASE LINE CLAMP CAPS are down and their bolts perpendicular to the TOWER BOOM legs.
7. **OPTIONAL:** THE TIP SECTION OF ELEMENTS #3, #2, AND #1 CAN NOW BE INSTALLED. You may also elect to do the element tip installation just prior to the antenna being place on a tower. If you do it now or later, refer again to the appropriate element assembly sheet for the hardware required to attach the tip sections.
8. Now do the final check and tightening of the all elements forward to the Element #11. TIGHTEN each bottom cradle EVENLY AND SECURELY.

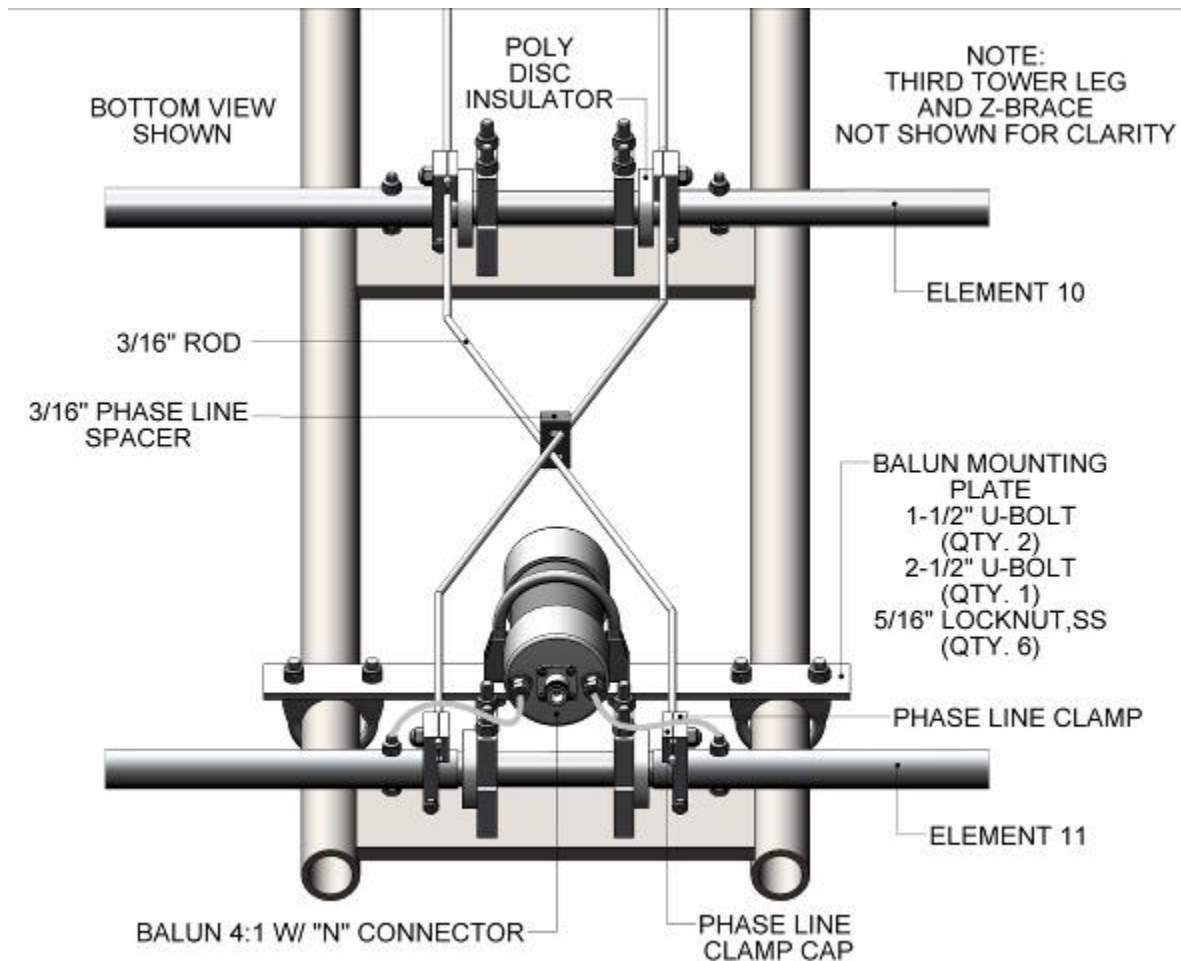
6-30LP11 OVERHEAD SUPPORT



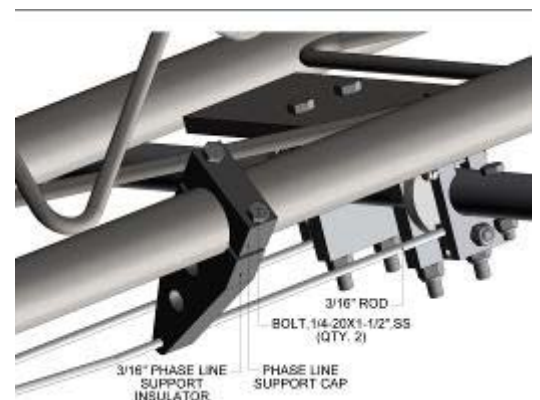
1. INSTALLING THE ELEMENT VERTICAL SUPPORT BRACKETS AND ELEMENT VERTICAL SUPPORT MASTS ON ELEMENT #2 AND #1. Set the bracket over element #2 as shown. Mount the VERTICAL ELEMENT SUPPORT MAST using 1-1/2" U-bolts and rotate the mast so the holes in the top flag are over the element. Adjust the bracket location so the flag holes are centered over the element center line. Install four (4) 1-1/2" stainless U-bolts in the appropriate holes and tighten all U-bolts.
2. Route the HPTG 1200 insulating cables, previously installed on these inner element sections, in toward the boom from each side. Open the 5/16" hook and eye turnbuckles until just one thread shows INSIDE the body. Hook the turnbuckle as shown and install cable eyes in the turnbuckle eyes. Slide two 1/8" cable clips on the cable and route the cable through the turnbuckle eye and over the cable eye. Push the cable end back through the clips, pull all the slack out of the cable and then push one clip close against the cable eye and begin tightening the nuts on the clip. Slide the second clip to about 1" away from the first clip and begin tightening both clips until secure. Using a 5/16" nut driver is the easiest way to tighten the clips.
3. Route the side guy cables in toward the two TOWER BOOM TABS on each side of the element. Install cable eyes in each tab hole. String two cable clips on each cable end and route the cable through the tab hole and over the cable eye. Pull all the slack out of the cable and slide the clip up and tighten as before. Repeat this procedure for element #1. Trim off excess cable as required.
4. Once the element tips are installed, the overhead cable turnbuckles should be adjusted to lift the element until the center element sections are level. Be sure to safety wire the turnbuckles so they will not loosen after installation.



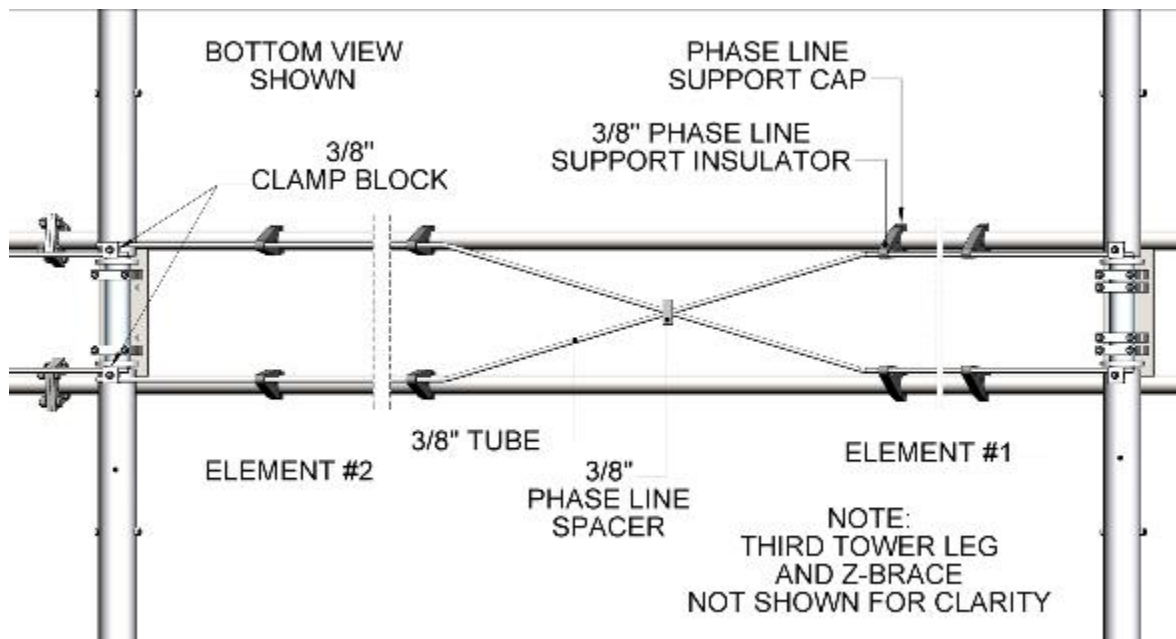
6-30LP11 BALUN & PHASE LINE



1. Mount the 4:1 BALUN MOUNTING PLATE assembly to the TOWER BOOM just behind element #11 as shown above. Route the balun leads to the 1/4-20 x 1-1/2 bolts through the element butts and tighten securely.
2. Locate the shortest pair of 3/16" rod phasing lines and slide a 3/16" PHASE LINE INSULATOR onto the rods and feed the front ends into the grooves in the PHASE LINE CLAMPS. Hanging below the element butts. Slide the rods far enough through to insert the other ends into the PHASE LINE CLAMPS on element #10. Center and align the rods so the bends are flat and parallel. Now tighten the front PHASE LINE CLAMPS only.
3. Continue by adding the next set of phasing lines between element #10 and #9. Center align the phasing rods and tighten the PHASE LINE CLAMPS on element #10. Continue installing phasing lines and 3/16" PHASE LINE SPACERS to element #8.
4. The phasing lines between element #8 and #7 and beyond require (4) 3/16" PHASE LINE SUPPORT INSULATORS between each element. String on the 3/16" PHASE LINE SPACER and then two 3/16" PHASE LINE SUPPORT INSULATORS from each end of the phasing lines. Position the assembly under the boom and add the PHASE LINE SUPPORT CAPS. Use 1/4-20 x 1-1/2" bolts that thread into 3/16" PHASE LINE SUPPORT INSULATORS. Tighten the bolts until no rotation of the 3/16" PHASE LINE SUPPORT INSULATOR is possible. DO NOT OVERTIGHTEN.



6-30LP11 BALUN & PHASE LINE



5. Continue adding these 3/16" rod phasing line assemblies until you reach and finish Element #4. Tighten the 3/16" PHASE LINE CLAMPS on element #4. **Note:** 3/8" tube phasing lines are used between element #4 through element #1.
6. Two pairs of 3/8" CLAMP BLOCKS should be attached to the butts of element #4. If they are not there, mount them now loosely on the 1/4-20 x 2-1/2" bolts through each butt.

THE DRIVE MAST BRACKET (OPTIONAL) IS MOUNTED LATER IN BETWEEN ELEMENT #4 AND #3. "SPECIAL" OFFSET BEND PHASE LINES ARE REQUIRED HERE TO CLEAR THE DRIVE MAST BRACKET.

7. Slide a 3/8" PHASE LINE SPACER onto the shortest set of 3/8" diameter phase lines. Now add (8) 3/8" PHASE LINE SUPPORT INSULATORS. **NOTE:** THIS SET OF LINES ARE NOT BENT SYMETRICALLY. CONNECT THE SHORT, STRAIGHT SECTIONS TO ELEMENT #4 and the longer straight sections to element #3. Center and align these phase lines and tighten the 3/8" CLAMP BLOCKS at element #4.
8. Element #3 should have two pairs of 3/8" PHASE LINE CLAMP CAPS on the element butts. If not, then add them now loosely. Continue installing this phase line set using eight (8) 3/8" PHASE LINE SUPPORT INSULATORS. Center and align the phasing lines and tighten 3/8" PHASE LINE CLAMP CAPS on element #3.
9. The phasing lines between element #2 and #1 require (8) 3/8" PHASE LINE SUPPORT INSULATORS, two on each line on each side of the crossover. Element #1 should have two pairs of 3/8" PHASE LINE CLAMP CAPS. Install now if not already on the element butts. Center and align the phase lines as before and tighten the 3/8" PHASE LINE CLAMP CAPS on both element #2 and #1. This completes the phasing line installation.

6-30LP11 PARTS & HARDWARE

	ELEMENT #1 12-18-08
DESCRIPTION	QTY
ELE 1 SEC 1, 3" X .125 X 120" SOE, 6061-T6	2
ELE 1 SEC 2, 2-1/2 X .125 X 116", SOE 6061-T6	2
ELE 1 SEC 3, 2" X .125 X 110" SOE, 6061-T6	2
ELE 1 SEC 4, 1-1/2" X .058 X 60" SOE 6063-T832	2
SLEEVE, 1-3/8 X .058 X 56.00 6063-T832	2
SLEEVE, 1-1/4 X .058 X 40.00 6063-T832	2
ELE 1 SEC 5, 1-1/4 X .058 X 45" SOE 6063-T832	2
SLEEVE, 1-1/8 X .058 X 37.00 6063-T832	2
ELE 1 SEC 6, 1" X .058 X 45" 6063-T832	2
SLEEVE, 7/8" X .058 X 66.0" 6063-T832	2
ELE 1 SEC 7, 3/4 X .049 X 60" SOE 6063-T832	2
ELE 1 SEC 8, 1/2 X .049 X 60" 6063-T832	2
CENTER SUPPORT INSUL, 2" X 36" W/ COUPLING RINGS	1
POLY DISC INSULATOR, 2" I.D.	2
CRADLE, 2" HD (MACH. ALUM.)	8
ELEMENT VERTICAL SUPPORT MAST 1-1/2" X 48" (WELDED)	1
ELEMENT VERTICAL SUPPORT BRACKET (STEEL, WELDED)	1
ELEMENT SIDE SUPPORT BRACKET (ALUMINUM, WELDED)	2
3/8" PHASE LINE CLAMP CAP	4
2" U-BOLT AND CRADLE	2
1-1/2" U BOLT AND CRADLE	7
TURNBUCKLE, 5/16, HOOK & EYE SS	2
HPTG 1200 PHILISTRAN, 28 FT	6
HARDWARE	
CABLE CLIPS, SMALL,	24
CABLE EYE, 1/8"	12
BOLT, 3/8-24 X 5", GRADE 5	8
LOCKNUT, 3/8-24 ZINC	8
BOLT, 3/8-16 X 4" SS	2
BOLT, 3/8-16 X 3-1/2", SS	2
LOCKNUT, 3/8-16, SS	4
NUT, 5-16-18, SS	18
LOCKWASHERS, 5/16" SPLIT RING, SS	18
BOLT, 1/4-20 X 3-1/4", SS	4
BOLT, 1/4-20 X 2-3/4", SS	4
BOLT, 1/4-20 X 2 1/4", SS	4
LOCKNUT, 1/4-20, SS	16
SCREW, 8-32 X 1-3/4", SS	4
SCREW, 8-32 X 1-1/2", SS	8
SCREW, 8-32 X 1-1/4", SS	4
SCREW, 8-32 X 1", SS	4
LOCKNUT, 8-32, SS	20
PENTROX, CUP	1

6-30LP11 PARTS & HARDWARE

ELEMENT #2
12-18-08

DESCRIPTION	QTY
ELE 2 SEC 1, 3" X .125 X 74" SOE, 6061-T6	2
ELE 2 SEC 2, 2-1/2 X .125 X 79", SOE 6061-T6	2
ELE 2 SEC 3, 2" X .125 X 64" SOE 6061-T6	2
ELE 2 SEC 4, 1-1/2 X .058 X 63" SOE 6063-T832	2
SLEEVE, 1-3/8 X .058 X 56.00 6063-T832	2
SLEEVE, 1-1/4 X .058 X 40.00 6063-T832	2
ELE S SEC 5, 1-1/4 X .058 X 44" SOE 6063-T832	2
SLEEVE, 1-1/8 X .058 X 37.00 6063-T832	2
ELE 2 SEC 6, 1" X .058 X 44" 6063-T832	2
SLEEVE, 7/8" X .058 X 71" 6063-T832	2
ELE 2 SEC 7, 3/4 X .049 X 66" SOE 6063-T832	2
ELE 2 SEC 8, 1/2 X .049 X 60" 6063-T832	2
CENTER SUPPORT INSUL. 2" X 36" W/ COUPLING RINGS	1
POLY DISC INSULATOR, 2" I.D.	2
CRADLE, 2" HD (MACH. ALUM.)	4
ELEMENT VERTICAL SUPPORT MAST 1-1/2 X 48" (WELDED)	1
ELEMENT VERTICAL SUPPORT BRACKET (STEEL, WELDED)	1
ELEMENT SIDE SUPPORT BRACKET (WELDED)	2
3/8" PHASE LINE CLAMP CAP	4
2" U-BOLT AND CRADLE	2
1-1/2" U BOLT AND CRADLE	7
TURNBUCKLE, 5/16, HOOK & EYE SS	2
HPTG 1200 PHILISTRAN, 20 FT	2
HARDWARE	
CABLE CLIPS, SMALL,	24
CABLE EYE, 1/8"	12
BOLT, 3/8-24 X 5", GRADE 5	4
LOCKNUT, 3/8-24 ZINC	4
BOLT, 3/8-16 X 4" SS	2
BOLT, 3/8-16 X 3-1/2", SS	2
LOCKNUT, 3/8-16, SS	4
NUT, 5/16-18, SS	18
LOCKWASHERS, 5/16" SPLIT RING, SS	18
BOLT, 1/4-20 X 3-1/4", SS	4
BOLT, 1/4-20 X 2-3/4", SS	4
BOLT, 1/4-20 X 2-1/4", SS	4
LOCKNUT, 1/4-20, SS	16
SCREW, 8-32 X 1-3/4", SS	4
SCREW, 8-32 X 1-1/2", SS	8
SCREW, 8-32 X 1-1/4", SS	4
SCREW, 8-32 X 1", SS	4
LOCKNUT, 8-32, SS	20
PENETROX CUP	1

6-30LP11 PARTS & HARDWARE

ELEMENT #3
12-18-08

DESCRIPTION	QTY
ELE 3 SEC 1, 3" X .125 X 36" SOE, 6061-T6	2
ELE 3 SEC 2, 2-1/2 X .125 X 41", SOE 6061-T6	2
ELE 3 SEC 3, 2" X .125 X 49" SOE 6061-T6	2
ELE 3 SEC 4, 1-1/2 X .058 X 63" SOE 6063-T832	2
SLEEVE, 1-3/8 X .058 X 56.00 6063-T832	2
SLEEVE, 1-1/4 X .058 X 40.00 6063-T832	2
ELE 3 SEC 5, 1-1/4 X .058 X 43" SOE 6063-T832	2
SLEEVE, 1-1/8 X .058 X 37.00 6063-T832	2
ELE 3 SEC 6, 1" X .058 X 28" 6063-T832	2
SLEEVE, 7/8" X .058 X 71.875" 6063-T832	2
ELE 3 SEC 7, 3/4 X .049 X 81" SOE 6063-T832	2
ELE 3 SEC 8, 1/2 X .049 X 63" 6063-T832	2
CENTER SUPPORT INSUL. 2" X 36" W/ COUPLING RINGS	1
POLY DISC INSULATOR, 2" I.D.	2
CRADLE, 2" HD (MACH. ALUM.)	4
3/8" PHASE LINE CLAMP CAP	4
HARDWARE	
BOLT, 3/8-24 X 5", GRADE 5	4
LOCKNUT, 3/8-24 ZINC	4
BOLT, 3/8-16 X 4" SS	2
BOLT, 3/8-16 X 3-1/2", SS	2
LOCKNUT, 3/8-16, SS	4
BOLT, 1/4-20 X 3-1/4", SS	4
BOLT, 1/4-20 X 2-3/4", SS	4
BOLT, 1/4-20 X 2-1/4", SS	4
LOCKNUT, 1/4-20, SS	16
SCREW, 8-32 X 1-3/4", SS	4
SCREW, 8-32 X 1-1/2", SS	8
SCREW, 8-32 X 1-1/4", SS	4
SCREW, 8-32 X 1", SS	4
LOCKNUT, 8-32, SS	20
PENETROX CUP	1

6-30LP11 PARTS & HARDWARE

6-30LP11 BOOM
12-18-08

DESCRIPTION	QTY
BOOM TOWER SECTION #1	1
BOOM TOWER SECTION #2	1
BOOM TOWER SECTION #3	1
BOOM TOWER SECTION #4	1
DRIVE MAST WELDMENT, ZINC	1 OPTIONAL
MAST PLATE, WELDMENT, ZINC	1
MAST PLATE "L"	1
MAST PLATE "R"	1
MAIN MAST OVERHEAD SUPPORT MAST (2" X .180 X 96" GALV)	1
GUY CABLE, HPTG 6700 PHILISTRAN X 70 FT.	1
TURNBUCKLE, 1/2 X 12 FORGED GALV.	2
CRADLE, 1 1/2" MACHINED ALUM. (13/32 HOLES)	16
TOWER SHIM (THICK)	12
TOWER SHIM (THIN)	12
HARDWARE	
BOLT, 1/2-13 X 2" GRADE 5, GALV. (TOWER BOLTS)	40
NUT, 1/2-13 GALV.	40
PAL NUT 1/2-13, GALV.	40
BOLT, 3/8-24 X 4" GRADE 5	8
BOLT, 3/8-24 X 3 1/2", GRADE 5	8
BOLT, 3/8-12 X 1 1/2", GRADE 5	8
NUT, 3/8-24, LOCKING, ZINC	24
CABLE EYES, 3/8"	4
CABLE CLIPS, 3/8"	8

6-30LP11 PARTS & HARDWARE

PHASING LINE SYSTEM & FEED 12-18-08

DESCRIPTION	QTY
3/8" X 204" TUBE, BENT, 6063-T832	2
3/8" X 172" TUBE, BENT, 6063-T832	2
3/8" X 137" TUBE, BENT, 6063-T832	2
3/16" X ROD, BENT, 6061-T6	2
3/16" X ROD, BENT, 6061-T6	2
3/16" X ROD, BENT, 6061-T6	2
3/16" X ROD, BENT, 6061-T6	2
3/16" X ROD, BENT, 6061-T6	2
3/16" X ROD, BENT, 6061-T6	2
3/16" X ROD, BENT, 6061-T6	2
3/16" X ROD, BENT, 6061-T6	2
PHASE LINE SUPPORT INSULATOR, FOR 3/8" TUBE	24
PHASE LINE SUPPORT INSULATOR, FOR 3/16 ROD	20
PHASE LINE SUPPORT CAP (DELTRIN)	44
.375 PHASE LINE SPACER, 3/4 X 2 X 2 " DELRIN	3
.188 PHASE LINE SPACER, 1/2 X 1-3/8 X 3/4" DELRIN.	7
BALUN, 4:1 W/ "N" CONN	1
BALUN MOUNTING PLATE, 1/4 X 1 1/2 X 12 ALUM	1
1 1/2 U-BOLT AND CRADLE	2
2 1/2 U-BOLT AND CRADLE	1
HARDWARE	
NUT, 5/16-18 SS	6
LOCK WASHER, 5/16 SS	6
BOLT, 1/4-20 X 1-3/4",SS	88
LOCK WASHER, 1/4" SPLIT RING, SS	88

6-30LP11 PARTS & HARDWARE

ELEMENT #4 TO #11
12-18-08

DESCRIPTION	QTY
SLEEVE, 1-5/8" X .058 X 56"	2
ELE 4 SEC 1A, 1-1/2" X .058 X 60" SOE (1/4 HOLE, TO FIT SELF)	2
ELE 4 SEC 2B, 1-1/2" X .058 X 60" SOE (TO EXCEPT 1 1/4)	2
ELE 5 SEC 1, 1-1/2" X .058 X 60" SOE (1/4 HOLE)	2
SLEEVE, 1-3/8" X .058 X 56" (1/4 HOLE)	4
SLEEVE, 1-3/8" X .058 X 55" (1/4 HOLE)	2
SLEEVE, 1-3/8" X .058 X 53"	2
ELE 6 SEC 1, 1-1/4" X .058 X 60" SOE (1/4"HOLE)	2
ELE 4 SEC 3, 1-1/4" X .058 X 60" SOE (2 HOLES)	4
SLEEVE, 1-1/4" X .058 X 37" (3 HOLES)	2
SLEEVE, 1-1/8" X .058 X 30" (1/4 HOLE)	2
SLEEVE, 1-1/8 X .058 X 30.00 (2 HOLES)	4
SLEEVE, 1-1/8 X .058 X 12" (1/4 HOLE)	2
ELE 11, SEC 1, 1" X .058 X 60.75" STR	2
ELE 7, SEC 1, 1" X .058 X 60" SOE, (1/4 HOLE)	8
ELE 6, SEC 2, 1" X .058 X 60" SOE (2 HOLES)	2
ELE 4, SEC 4, 1" X .058 X 39" SOE	4
SLEEVE, 7/8" X .058 X 15"	2
ELE 8, SEC 2, 3/4 X .049 X 63" STR	2
ELE 9, SEC 2, 3/4 X .049 X 39.25" STR	2
ELE 4, SEC 5, 3/4 X .049 X 39" SOE	8
ELE 10, SEC 2, 3/4 X .049 X 19.75" STR	2
ELE 7, SEC 3, 1/2 X .049 X 63"	2
ELE 4 SEC 6, 1/2 X .049 X 56"	4
ELE 6, SEC 4, 1/2 X .049 X 43"	2
FIBERGLASS ROD, 1-1/4" X 24"	2
FIBERGLASS ROD, 1" X 24"	1
FIBERGLASS ROD, 7/8 X 30"	5
POLY DISC INSULATOR, 1-1/4" ID.	4
POLY DISC INSULATOR, 1" ID.	2
POLY DISC INSULATOR, 7/8" ID.	10
PHASE LINE CLAMP, 1-1/2"	4
PHASE LINE CLAMP, 1-1/4"	2
PHASE LINE CLAMP, 1"	10
PHASE LINE CLAMP CAP, FOR 3/16" PHASE LINES	16
CRADLE, 1-1/4" HD (MACH. ALUM)	8
CRADLE, 1" HD (MACH. ALUM)	4
CRADLE, 7/8" HD (MACH. ALUM)	20
3/8" CLAMP BLOCK (SINGLE 1/4 HOLE)	4

HARDWARE, NEXT PAGE

6-30LP11 PARTS & HARDWARE

ELEMENT #4 TO #11
CONTINUED
12-18-08

HARDWARE	QTY
BOLT, 5/16-24 X 4 1/2 " GRADE 5	8
BOLT, 5/16-24 X 4" GRADE 5	24
NUT, 5/15-24 LOCKING,ZINC	32
BOLT, 1/4-20 2-1/2" SS	2
BOLT, 1/4-20 X 2" SS	4
BOLT, 1/4-20 X 1-1/2" SS	10
SCREW, 1/4-20 X 1" FH, SS	16
NUT, LOCKING 1/4-20 SS	32
SCREW, 8-32 X 2", SS	10
SCREW, 8-32 X 1-3/4" SS	10
SCREW, 8-32 X 1-1/2" SS	22
SCREW, 8-32 X 1-1/4" SS	28
SCREW, 8-32 X 1" SS	16
LOCKNUT, 8-32 SS	86
PENETROX CUP	1

Carefully manufactured by:

M² ANTENNA SYSTEMS, INC.

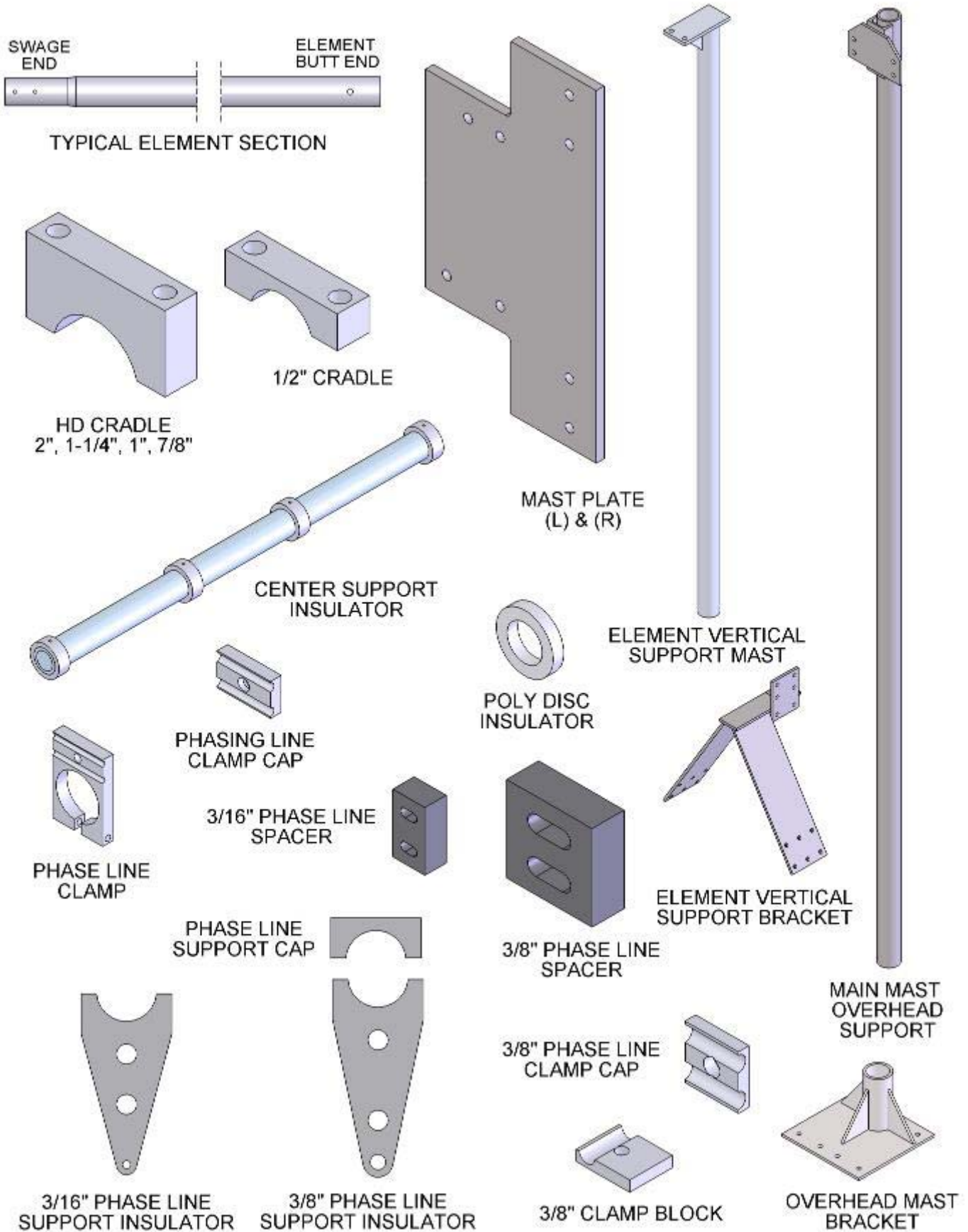
4402 N. Selland Ave.

Fresno, CA 93722

(559) 432-8873 Fax: 432-3059

www.m2inc.com Email: sales@m2inc.com

6-30LP11 PARTS IDENTIFICATION



6-30LP11 SPARE PARTS

1-15-09

DESCRIPTION	QTY
BOLT, 3/8-16 X 4", SS	2
BOLT, 3/8-16 X 3-1/2", SS.....	2
NUT, LOCKING, 3/8-16, SS	6
BOLT, 3/8-24 X 5", GRADE 5	12
NUT, LOCKING, 3/8-24, ZINC.....	10
BOLT, 1/4-20 X 3-1/4", SS.....	4
BOLT, 1/4-20 X 2-3/4", SS.....	4
BOLT, 1/4-20 X 2-1/2", SS.....	2
BOLT, 1/4-20 X 2-1/4", SS.....	4
BOLT, 1/4-20 X 2", SS.....	2
BOLT, 1/4-20 X 1-1/2", SS.....	4
SCREW, FLATHEAD, 1/4-20 X 1", SS	4
NUT, LOCKING, 1/4-20, SS	24
SCREW, 8-32 X 2-1/4", SS.....	2
SCREW, 8-32 X 2", SS.....	4
SCREW, 8-32 X 1-3/4", SS.....	4
SCREW, 8-32 X 1-1/2", SS.....	8
SCREW, 8-32 X 1-1/4", SS.....	10
SCREW, 8-32 X 1", SS.....	8
NUT, LOCKING, 8-32, SS	24

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