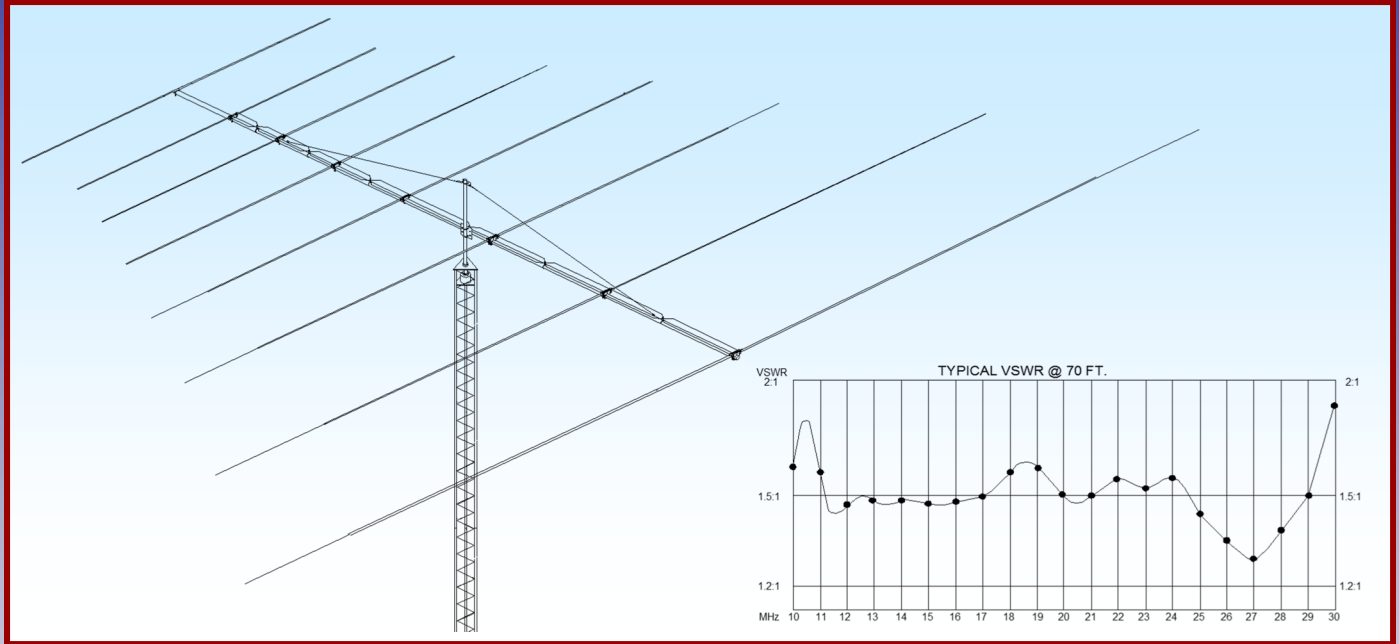




# M2 Antenna Systems, Inc.

## Model No: 10-30LP8-125



### SPECIFICATIONS:

Model .....	10-30LP8-125	Power Handling .....	3 Kw, Higher avl.
Frequency Range .....	10-30 MHz Continuous	Boom Length / Dia .....	29.5' / 3.0 x .125 Wall
*Gain free space / 65' .....	5.2 dBi / 10.5 dBi 10-30	Maximum Element Length .....	49'
Front to back .....	15 dB 10-30 MHz	Turning Radius: .....	28'
Beamwidth .....	E=70° Typical	Mast Size .....	2" to 3" Nom.
Feed Impedance .....	50 Ohms Unbalanced	Wind area / Survival .....	13.0 Sq. Ft. / 125 MPH
Maximum VSWR .....	2.0:1	Weight / Ship Wt. ....	125 Lbs. / 152 Lbs.
Input Connector .....	SO-239, Other avl.		

**\*Subtract 2.14 from dBi for dBd**

### FEATURES:

Twenty years of log periodic design experience have gone into the design of the 10-30LP8-125 HYBRID log periodic. The result is a rugged, versatile antenna with excellent performance over a 20 MHz bandwidth. It's designed for years of trouble free service, featuring machined, 1/2" thick element-to-boom clamps, massive solid fiberglass rod center insulators, stainless steel hardware, and elements sleeved to achieve at least the 125 MPH wind survival rating. A broadband 3000 Watt 4:1 ferrite balun is supplied. Other high power baluns are available up to 5 kW.

Maritime, Government, Commercial, MARS, Amateur Radio communications and Shortwave listening are among 10-30LP8-125's many, many uses. For receive only, it works extremely well from 1 to 100 MHz. This log will survive many years of all Mother Nature has to offer and continue to provide top performance with minimal maintenance. Stack with the 6-10LP5 for complete, efficient coverage from 6 to 30 MHz.

# 10-30LP8-125 ASSEMBLY MANUAL

BEFORE YOU BEGIN: Look over the DIMENSION SHEET, HARDWARE AND ELEMENT ASSEMBLY DRAWINGS to get familiar with the various parts of the log periodic. Tools handy for assembly process: screwdriver, 11/32, 7/16, 1/2, 9/16 and 5/8" spin-tites, end wrenches and/or sockets, measuring tape.

***A small container of zinc paste (Penetrox, Noalox, or equiv.) has been provided to enhance and maintain the quality of all electrical junctions on this antenna. Apply a thin coat wherever two pieces of aluminum come in contact or any other electrical connections are made.***

1. ASSEMBLING THE ELEMENT MOUNTING CLAMP PLATES. SEE HARDWARE DRAWINGS.  
The clamp plates fit THREE diameters of fiberglass rod insulators. Pair them up as follows:
  - A. The four 3 x 6 x 1/2" plates milled with a 5/8" radius channel are for ELEMENT #1 and #2 and clamps over the 1-1/4" x 24" fiberglass rod, center insulator
  - B. The two other 3 x 6 x 1/2" clamp plates, milled with a 1/2" radius channel, are for ELEMENT #3 and clamps 1" x 24" fiberglass rods.
  - C. Elements #4 through #7 use a single 2-1/2 x 4 x 3/8" plate and a matching rectangular 1-3/4 x 4 x 1/4" clamp cap, and clamps 7/8 x 29-3/4" long fiberglass rods. (Elements #4, 5, 6, and 7 use a single bottom cradle each).
  - D. Element #8, the front director element mounts differently, using two clamp cradles as described in step 12.
  - E. Start by assembling the 1-1/4" rod CLAMP PLATES together with 1/4-20 x 2-1/2" bolts to the six outer holes. Add the 1/4-20 locknuts finger tight. Slip in the 1-1/4 X 24" fiberglass rod and rotate until the element mounting holes are vertical. For elements #1 and #2. ***Center the rods and tighten the hardware EVENLY, so the plates are parallel and the same amount of threads are showing through all the locknuts.***
2. Assemble the remaining element clamp plate sets to the fiberglass rods. The hardware is as follows: The clamp plates pairs for ELEMENT #3 require (6) 1/4-20x2-1/2" bolts and locknuts and a 1" x 24" Fiberglass rod. The next four elements (#4, 5, 6, 7) each require FOUR 1/4-20x1-1/2" bolts and locknuts and a 7/8" x 29-3/4" Fiberglass rod.
3. Now slide a POLYETHYLENE DISC INSULATOR (1-1/4", 1" or 7/8" internal Dia.) onto each end of ALL the FIBERGLASS RODS and push them up against the clamp plates. The disc insulators are sometimes a very tight fit on the rods. If so, place them in hot water a few moments before installation. Set clamp plate assemblies aside for later.
4. ELEMENT ASSEMBLY.  
Refer to the ELEMENT ASSEMBLY AND DIMENSION SHEET. Most of the internal and external strengthening sleeves are factory installed.  
The correct hardware to join the various sizes are as follows:  
1-5/8 to 1-1/2 tubing use 8-32 x 2" screws.  
1-1/2" to 1-1/4" tubing use 8-32 x 1-3/4  
1-1/4" to 1" tubing use 8-32 x 1-1/2" screws.  
For 1" to 3/4" tubing use 8-32 x 1-1/4" screws.  
For 3/4" to 1/2" tips use 5/8" compression clamps  
(SEE COMPRESSION CLAMP & TIP ASSEMBLY DETAIL).  
Locknuts have been provided for all the element assembly screws. Tighten the nuts until the joint doesn't move when wiggled or shook. The element butt section closest to the boom always has one hole located at the butt for a 1/4-20 bolt, 1/2" longer than the element section diameter. Loosely install the bolts at this time as they must be removed later while installing the elements to the fiberglass rod insulators. Pair up element halves and set aside.

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5. Prepare the 1-1/2" PHASING LINE CLAMP BLOCKS AND PLATES for element #1 and #2 by applying a little paste to the channels on each face. Then loosely assemble plates to blocks, channel to channel, with 1/4-20 x 1" FLATHEAD SCREWS AND LOCKNUTS. Loosely install an 8-32 x 2" screw and locknut through block clamp fingers. Apply zinc paste to the last inch of the 1-1/2" element butts and then install a PHASING LINE CLAMP BLOCK assembly onto the end of each element butt with the small clamp plate oriented toward the element butt.

Now position each phasing line clamp block about 1/4 inch away from the element end and with the 8-32 element clamp screw oriented to the bottom. Tighten screw and locknut just enough to keep the block from moving (it will be repositioned when phasing lines are installed). Repeat for other element half. Repeat for ELEMENT #3 using 8-32 x 1-3/4" screws and locknuts. Continue with elements sections #4 through #7 using 8-32 x 1-1/2" screws and locknuts. Now add the outer element assemblies to the 1-1/4" sections.

## 6. BOOM ASSEMBLY

Wipe off any dirt or grime from the splice section. inspect the coupling rings for nicks or gouges and file off if found. Apply a small amount of light oil and gently insert it into one drilled end of the straight 15' boom section. Align the holes, install the 1/4-20 x 3-1/2" bolts and locknuts, and tighten. Repeat for the front 180" boom section.

7. Install the 3/8 EYEBOLTS in the boom, securing with stainless 3/8-16 nuts and lock washers. Align the eyes parallel with the boom and tighten.
8. Orient the boom with the eyebolts "up". Using a tape measure and a marking pen or masking tape, place a mark 1/2" in from the rear of the boom. This will be where you position the back edge of the clamp plate for element #1. Now measure forward 83.75" from that mark and make another mark. Identify this position as element #2. Continue marking the locations of all the elements using the element spacing figures found on the DIMENSIONS SHEET. NOTE: THE FOLLOWING ASSEMBLY IS EASIER IF THE BOOM IS UP AT OR NEAR WAIST LEVEL.
9. Attach Element #1 to the boom, eyebolts "up". Loosely attach two BOTTOM CRADLES to the bottom of the clamp plates using the 1/4-20 x 2-3/4" hardware. Slip Element #1 over the rear of the boom, placing the back edge of the rear plate on your first mark. ALIGN the elements horizontal perpendicular to the eyebolts and tighten bolts EVENLY and firmly. Use element #1 as the element alignment reference.
10. Mount the next element clamp assemblies in element position #2 and #3. First place the clamp plates on the boom at the mark and then add the two bottom cradles and 1/4-20 x 2-3/4" bolts. Align with the first element clamp and tighten **gently**. FINAL ALIGNMENT of the elements can be done after the elements are mounted.
11. Mount ELEMENT #4, #5, #6, AND #7. Mount the clamp plates with the 7/8" diameter fiberglass rods, again positioning each clamp at the mark, aligning with the first clamp and tightening **gently**. These elements require only one cradle.

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12. Now mount the DIRECTOR. Insert the 3/4" x 60" element sections into the 7/8 x 30" center tube, align the holes and drop through two 1/4-20 x 5" bolts. Install an inverted cradle onto the bolts and up against the 7/8" sleeve section. Place this assembly on the boom. Add the bottom cradle and the locknuts. Align the completed element with the element #1 at the other end of the boom and tighten the nuts. Install the Director's 1/2" tip sections with 5/8" compression clamps.
13. MOUNTING ELEMENT HALVES: REFER TO DIMENSION SHEET AND HARDWARE ASSEMBLY DRAWINGS.
14. Now carefully align elements #2 through #8 to element #1. TIGHTEN each bottom cradle EVENLY AND SECURELY.
15. INSTALLING THE PHASING LINES. SEE DIMENSION SHEET & HARDWARE ASSEMBLY DRAWINGS
  - A. Start with the shortest set between element #6 and #7. For each set, feed the phasing lines through a 3/4" x 3" DELRIN SPACER so that the spacer sits at the crossover point between the lines. Hold the spacer in place loosely around the boom with a large nylon tie but don't tighten it yet. Adjust phasing lines so that their bends are even and the lines run parallel to the boom.
  - B. Apply a small amount of conductive paste to the rod ends and feed the #7 ends into the clamp block channels until 1/4" extends beyond clamp. Tighten the 1/4-20 x 1" flathead screws and locknuts on element #7. Then adjust the block assemblies flush to the disc insulators and tighten 8-32 clamp screws. Insert the other rod ends into the clamp block assemblies on element #6 but do not tighten. Continue to the next phasing line set between element #5 and #6. Apply paste and insert the ends into the clamp blocks at element #6 and NOW tighten the flathead screws and nylon tie.
  - C. Continue in the same fashion tightening the hardware and nylon ties as you go. Note the phasing lines between elements #3 and #4. The bends in this set of phasing lines are **offset**, with the **crossover point closer to element #3**. This offset is to allow proper placement of the boom to mast plate.
16. MOUNTING THE 4:1 BROAD BAND BALUN. ON ELEMENT #8

Secure the BALUN to the 2" x 4-1/2" BALUN MOUNTING PLATE with a 2-1/2" U-bolt and cradle. Tighten nuts only enough to secure balun. DO NOT OVER TIGHTEN - BALUN HOUSING COULD BE DAMAGED! Install Balun/Plate to boom with 3" U-bolt and cradle. Position balun in front of element #8, connector pointing to rear and leads easily reaching phasing line clamp block screw studs. Now remove the 1/4 inch nuts from the clamp block screws. Apply some zinc paste to the lugs on the balun leads and place over each screw stud. Replace the nuts and re-tighten.
17. Attach the BOOM TO MAST PLATE with the two large 3 inch U-bolts. Center it at the Delrin standoff between element #3 and #4. Reshape the phasing lines as needed to clear the plate by at least 1/2". Boom to mast plate will be oriented in the diamond/triangle configuration to clear phasing lines.

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## 18. OVERHEAD BOOM SUPPORT SYSTEM.

A. Attach one end of the 5/16" Dacron cord to the rear eyebolt using two turns around the eyebolt and a series of three half hitches or equivalent knots. Finish with about 6 inches of cord after the knots. **Without cutting the cord, do the same at the front eyebolt.** Pull on the knots **HARD** to **SET** them. Seal ends with heat or flame to prevent fraying. Tape the excess 6 inches of cord back to main cord tightly with black vinyl electricians tape.

B. TEMPORARILY insert a 2 inch U-bolt through the turnbuckle plate and add two nuts so about 1/2" of the threads stick out. Insert this assembly through the top set of 2" U-bolt holes in the boom to mast plate from the boom side and add two more nuts. Open the two turnbuckles up until just **a thread or two** from each end shows **inside** the body of the turnbuckle. Hook the turnbuckles into the holes at the edge of the turnbuckle plate. Equalize the Dacron cord over the plate and cut it. Take two wraps of the cord through the eye of the rear turnbuckle, PULL the cord as tight as possible and make the knots as before. Repeat for the front cord section and turnbuckle. Cut off any excess over one foot long and again seal and tape back to the main cord.

C. Now DISASSEMBLE the U-bolt from the boom to mast plate. Before installation, if possible, install a short temporary mast, attach turnbuckle, and let the overhead guy system support the boom overnight. The Dacron cord DOES NOT STRETCH UNDER THIS LOAD but it's weave will take a SET and the boom may droop just a bit. If your boom droops again following final adjustments, check your knots. They may be slipping.

D. After final installation of the antenna, the turnbuckle plate, installed loosely with a 2" U-bolt, is raised up the mast. When the boom is straight the U-bolt is tightened. This should place the turnbuckle plate 4 to 6 feet above the boom. Do the final boom straightening with the turnbuckles and safety wire to preserve adjustments.

19. Install all element tip sections that may have been removed or omitted to facilitate other assembly procedures. Refer to Dimension Sheet. Use 5/8" compression clamps for 3/4" to 1/2" tubing, 8-32 x 1-1/4" hardware for 3/4" to 1" tubing.
20. Check ALL hardware for tightness. Check ALL element sections, especially tip sections, for correct placement. Make any final alignment adjustments.
21. Attach feedline section to balun. Route over element #7 and route back to boom to mast plate. Secure at regular intervals with tape or nylon ties.
22. When mounting this log periodic on a tower or mast with other antennas there may be interaction with other nearby antennas, particularly if they are resonant in the 10 to 30 MHz band. In general VHF and/or UHF antennas mounted for HORIZONTAL POLARITY should be at least 40" above or below the log antenna. Use good quality 50 Ohm feed line to feed the log and be sure your tower and rotator system can handle to wind area and weight of this antenna.

THIS COMPLETES ANTENNA ASSEMBLY

CAREFULLY DESIGNED AND MANUFACTURED BY:

**M<sup>2</sup> ANTENNA SYSTEMS INC.**

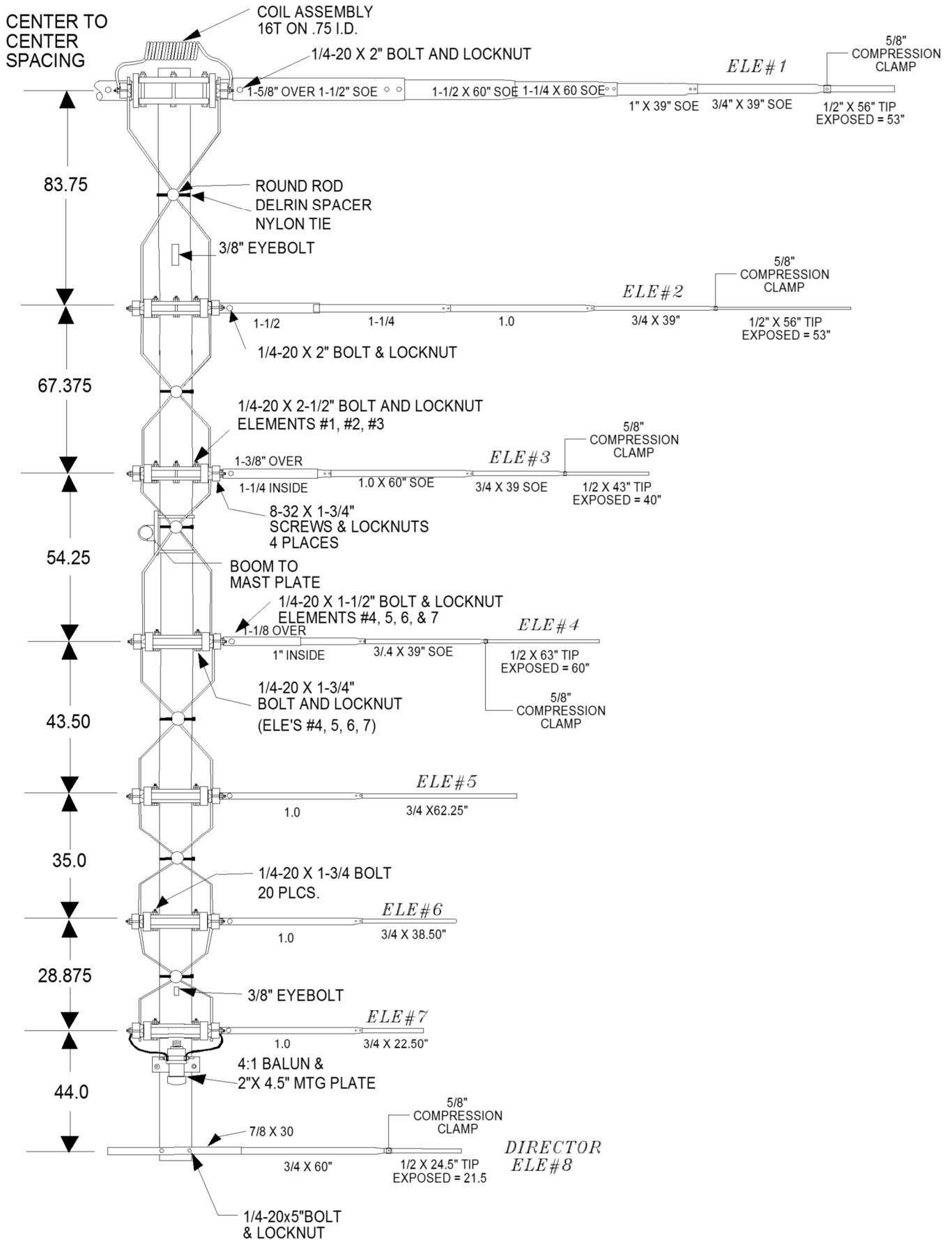
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FRESNO, CA 93722

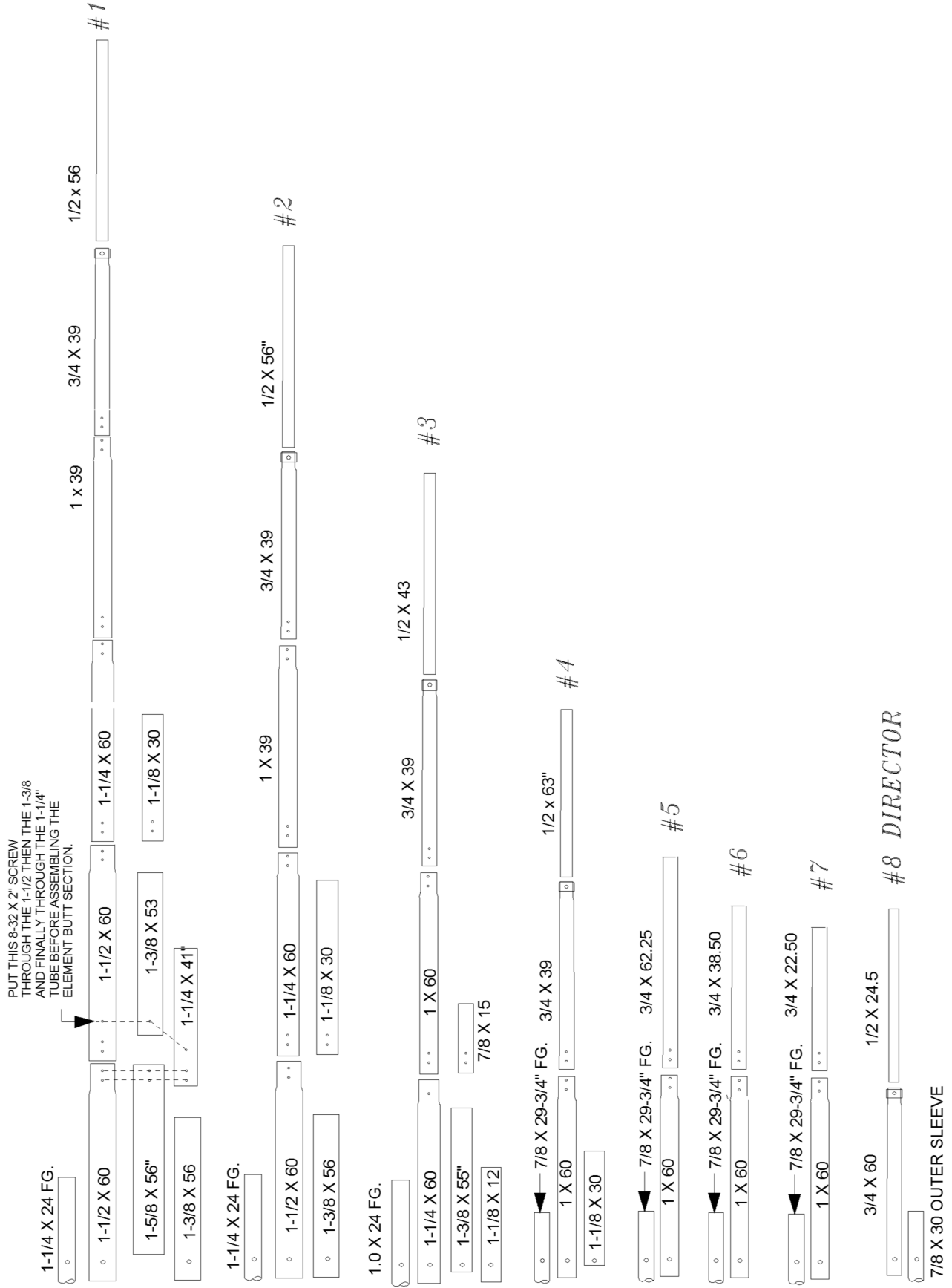
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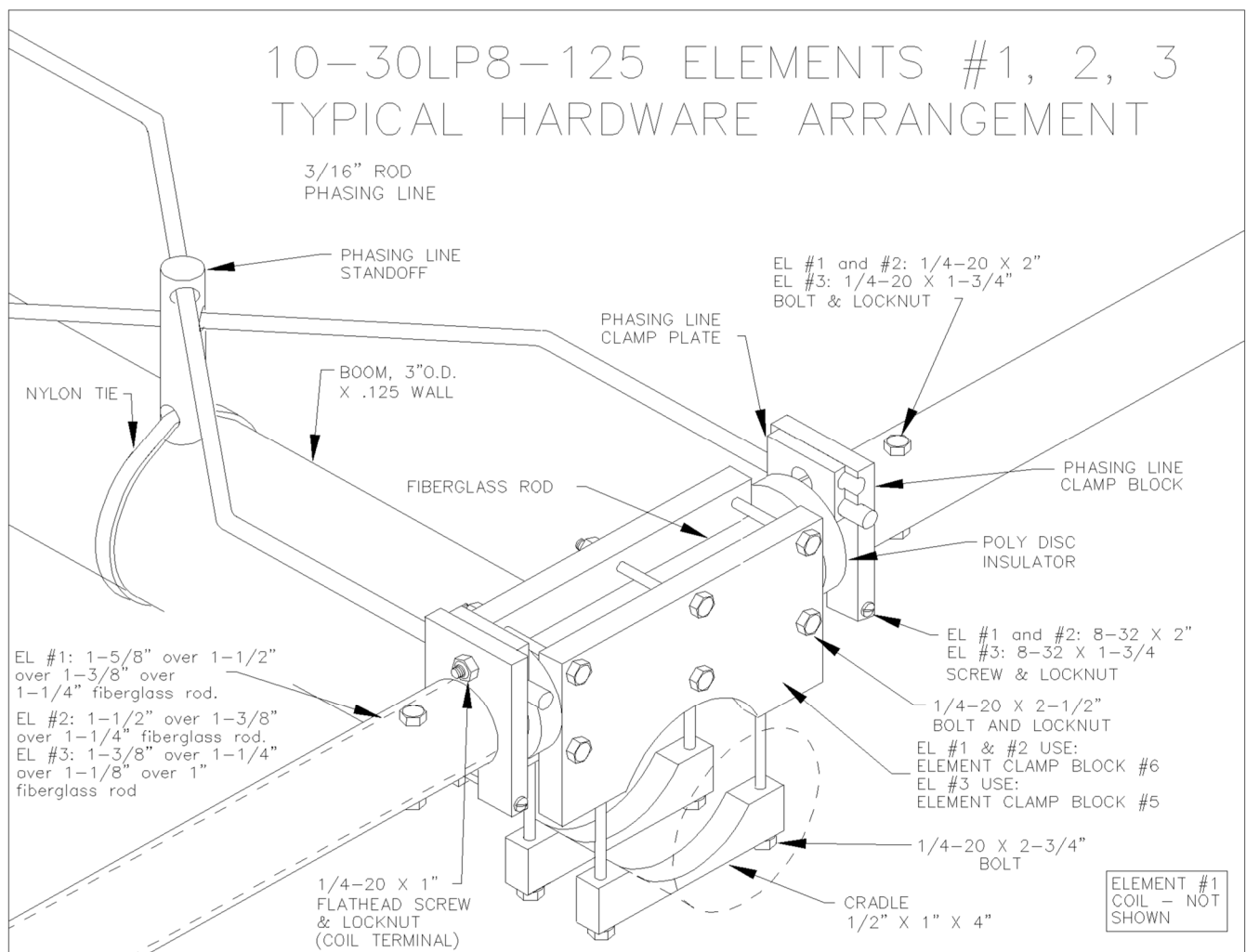
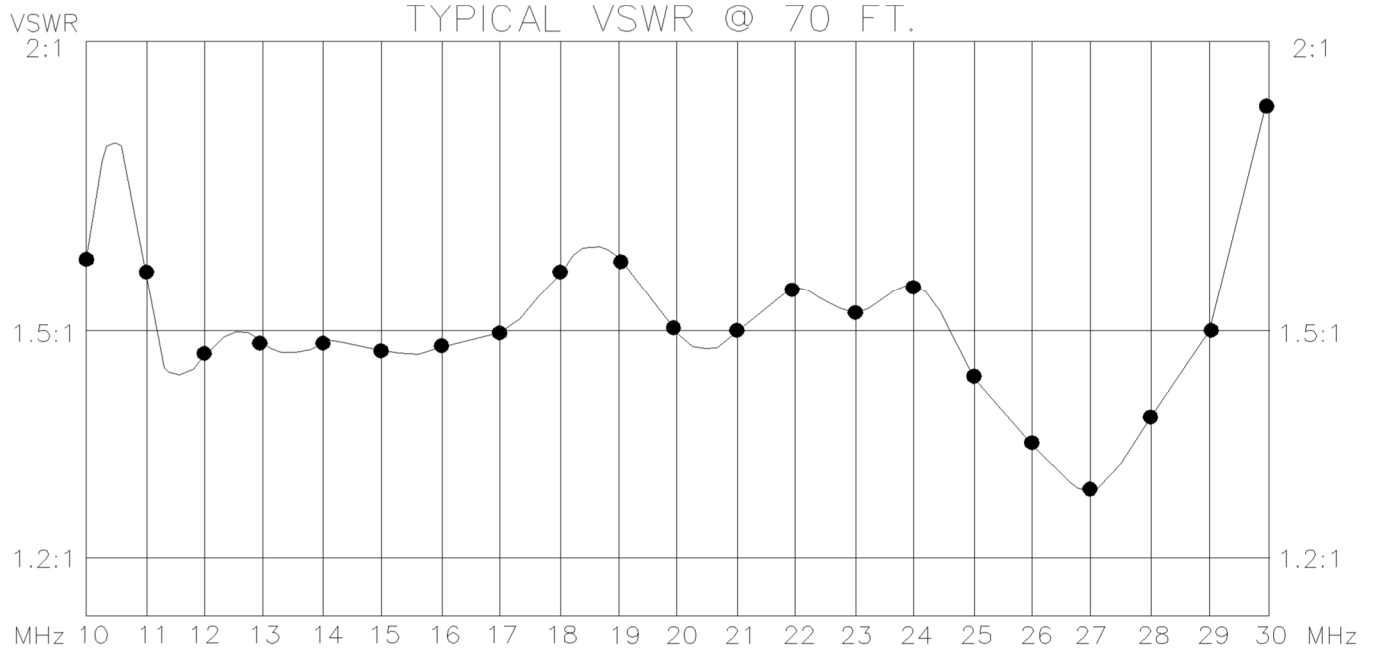
# 10-30LP8-125 DIMENSION SHEET



# 10-30LP8-125 ELEMENT LAYOUT



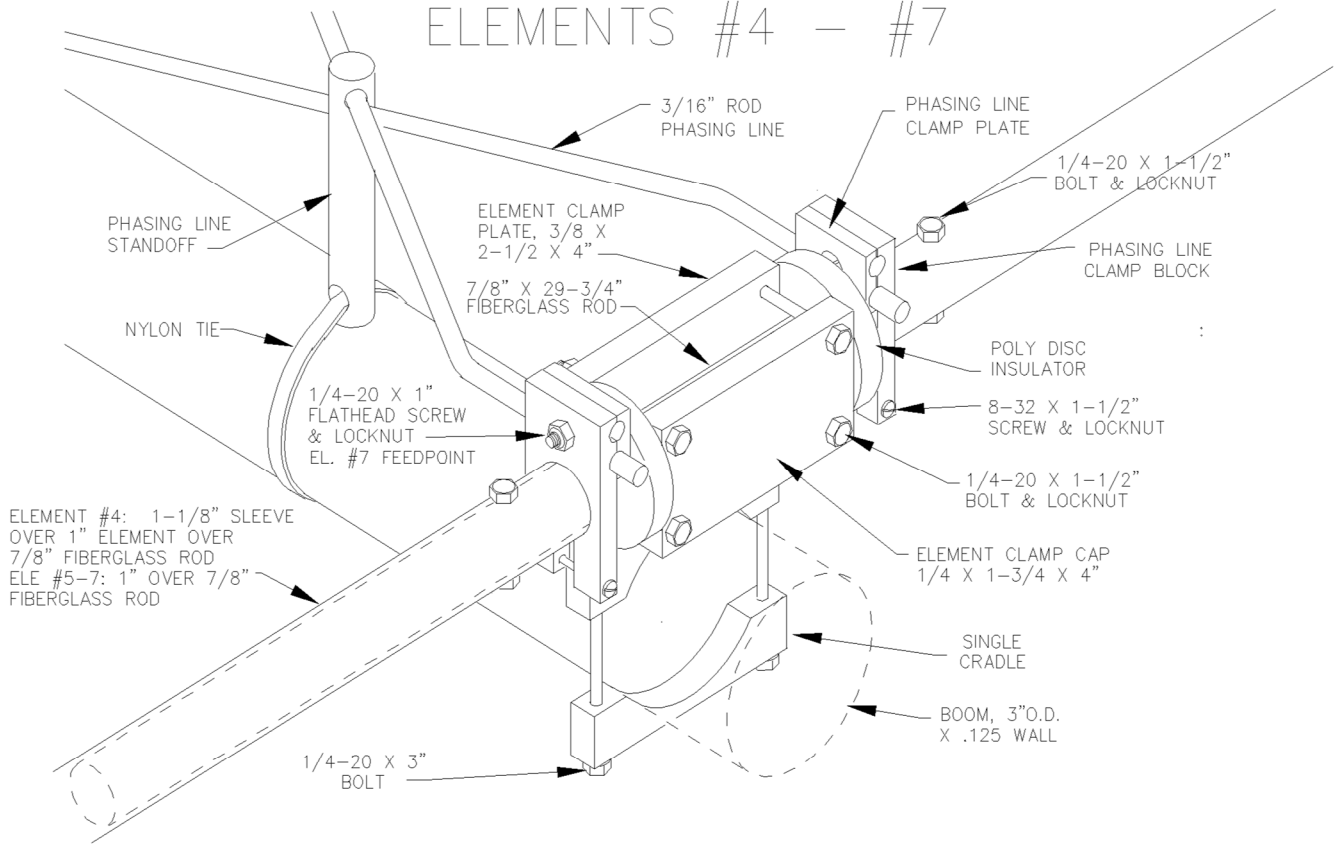
# 10-30LP8-125 ASSEMBLY DETAILS



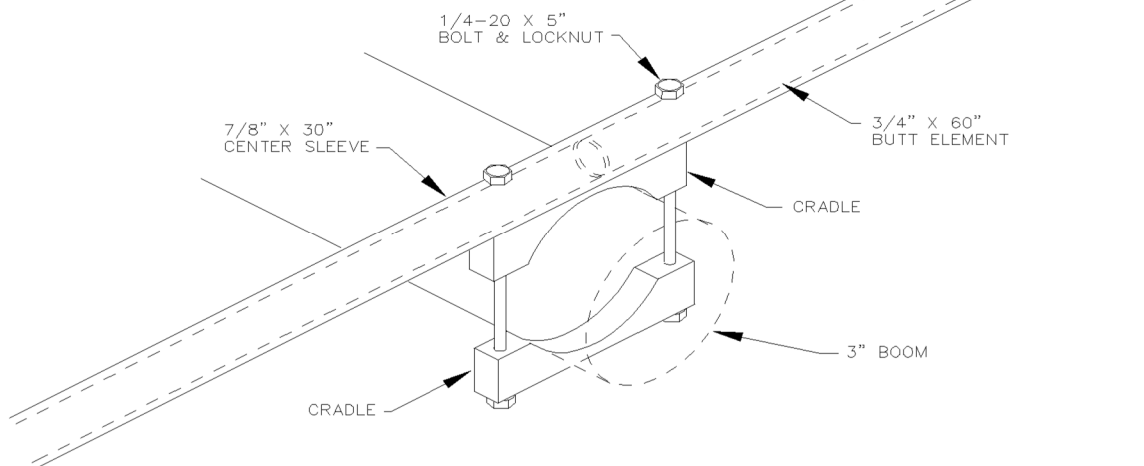


# 10-30LP8-125 ASSEMBLY DETAILS

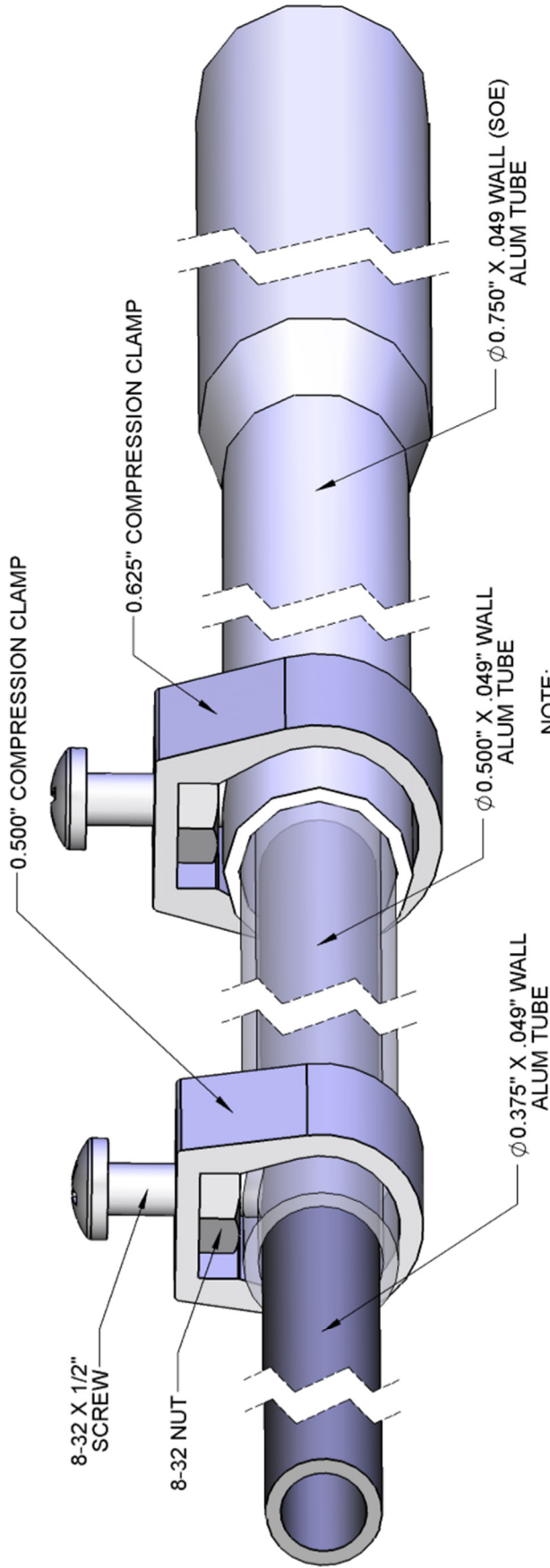
## TYPICAL HARDWARE ARRANGEMENT ELEMENTS #4 - #7



## DIRECTOR HARDWARE ARRANGEMENT ELEMENT #8



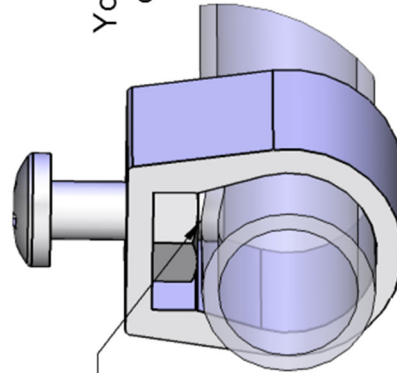
# GENERIC COMPRESSION CLAMP DETAIL



NOTE:  
TUBES SHOWN TRANSPARENT  
TO SHOW MORE 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.



NOTE:  
8-32 X 1/2" SCREW  
PRESSES ON INNER TUBE

NOTE: INSIDE TUBE NOT SHOWN FOR CLARITY

# 10-30LP8-125 PARTS & HARDWARE

DESCRIPTION.....	QTY
BOOM SECTION, 3 X .125 X 180" ALUMINUM .....	2
BOOM SPLICE ASSY, 2-1/2 X .125 X 120" WITH 5 COUPLING RINGS, ALUM. ....	1
SLEEVE, 1-5/8 X .058 X 56" ALUMINUM .....	2
ELEMENT, 1-1/2 X .058 X 60" SOE ALUMINUM, 9/32" HOLE .....	4
ELEMENT, 1-1/2 X .058 X 60" SOE ALUMINUM, BUTT DRILLED WITH 2 HOLES .....	2
SLEEVE, 1-3/8 X .058 X 56" ALUMINUM, 9/32" HOLE .....	4
SLEEVE, 1-3/8 X .058 X 53" ALUMINUM, PLAIN, 0.173" HOLE.....	2
SLEEVE, 1-3/8 X .058 X 55" ALUMINUM, 9/32" HOLE .....	2
ELEMENT, 1-1/4 X .058 X 60" SOE ALUMINUM, BUTT DRILLED WITH 2 HOLES .....	4
ELEMENT, 1-1/4 X .058 X 60" SOE ALUMINUM, 9/32" HOLE .....	2
SLEEVE, 1-1/4 X .058 X 41" ALUMINUM, BUTT DRILLED WITH 2 HOLES .....	2
SLEEVE, 1-1/8 X .058 X 30" ALUMINUM, BUTT DRILLED WITH 2 HOLES .....	4
SLEEVE, 1-1/8 X .058 X 30" ALUMINUM, 9/32" HOLE .....	2
SLEEVE, 1-1/8 X .058 X 12" ALUMINUM, 9/32" HOLE .....	2
ELEMENT, 1 X .058 X 60" SOE ALUMINUM, BUTT DRILLED WITH 2 HOLES.....	2
ELEMENT, 1 X .058 X 60" SOE ALUMINUM, 9/32" HOLE.....	8
ELEMENT, 1 X .058 X 39" SOE ALUMINUM, BUTT DRILLED WITH 2 HOLES.....	4
SLEEVE, OUTER, 7/8 X .058 X 30" 9/32" HOLE (DIR #8) .....	1
SLEEVE, (#3 DIR) 7/8 X .058" X 15" ALUMINUM, BUTT DRILLED WITH 2 HOLES .....	2
ELEMENT, 3/4 X .049 X 60" SOE ALUMINUM, 9/32" HOLE.....	2
ELEMENT, 3/4 X .049 X 39" SOE ALUMINUM, BUTT DRILLED WITH 2 HOLES.....	8
ELEMENT, 3/4 X .049 X 62.25" ALUMINUM .....	2
ELEMENT, 3/4 X .049 X 38.5" ALUMINUM .....	2
ELEMENT, 3/4 X .049 X 22.50" ALUMINUM .....	2
ELEMENT, 1/2 X .049 X 63" ALUMINUM .....	2
ELEMENT, 1/2 X .049 X 56" ALUMINUM .....	4
ELEMENT, 1/2 X .049 X 43" ALUMINUM .....	2
ELEMENT, 1/2 X .049 X 24.5 ALUMINUM.....	2
ROD, PHASING, 3/16 X 88.75" ALUMINUM .....	2
ROD, PHASING, 3/16 X 72.375" ALUMINUM .....	2
ROD, PHASING, 3/16 X 59.25" ALUMINUM .....	2
ROD, PHASING, 3/16 X 48.5" ALUMINUM .....	2
ROD, PHASING, 3/16 X 41.0" ALUMINUM .....	2
ROD, PHASING, 3/16 X 35.0" ALUMINUM .....	2
FIBERGLASS ROD INSULATOR, 1-1/4 X 24" .....	2
FIBERGLASS ROD INSULATOR, 1 X 24".....	1
FIBERGLASS ROD INSULATOR, 7/8 X 29.75" .....	4
BOOM TO MAST PLATE, 8 X 8 X 1/4" ALUMINUM, PUNCHED .....	1
BALUN, 4:1 FERRITE CORE, 3 kW .....	1

## HARDWARE BOX:

ELEMENT MOUNTING PLATE, 1/2 X 3 X 6", .625" RADIUS.....	4
ELEMENT MOUNTING PLATE, 1/2 X 3 X 6", .500" RADIUS.....	2
SMALL ELEMENT MOUNTING PLATE, 3/8 X 2-1/2 X 4" .....	4
SMALL ELEMENT MOUNTING CAP, 1/4 X 1-3/4 X 4" .....	4
CRADLE 3.0 LD, 1/2 X 1.0 X 4" ALUMINUM .....	12
PHASE LINE CLAMP, 3/8 X 1-3/4 X 2-5/8" WITH 1-1/2" HOLE .....	4
PHASE LINE CLAMP, 3/8 X 1-1/2 X 2-7/16" WITH 1-1/4" HOLE .....	2
PHASE LINE CLAMP, 3/8 X 1-1/4 X 2-3/16" WITH 1" HOLE .....	8
PHASE LINE CLAMP CAP, 1/4 X 3/4 X 1-1/4" ALUMINUM .....	14
POLY DISK INSULATOR, 3/8 X 2" , MACHINED 1 1/4" HOLE .....	4
POLY DISK INSULATOR, 3/8 X 2" , MACHINED 1" HOLE .....	2
POLY DISK INSULATOR, 3/8 X 2" , MACHINED 7/8" HOLE .....	8
PHASE LINE STANDOFF, 3/4 X 3.0" DELRIN .....	6

# 10-30LP8-125 PARTS & HARDWARE

TURNBUCKLE PLATE, 2 X 5 X 3/16" ALUMINUM, PUNCHED .....	1
EYEBOLTS, 3/8" X 6" FORGED GALV .....	2
TURNBUCKLES, 3/8" X 8" FORGED EYE & JAW GALV .....	2
PHYLISTRAND, HPTG 4000 X 34 FT., .....	1
U-BOLT, 3" .....	3
U-BOLT, 2" HEAVY DUTY 3/8" .....	4
U-BOLT, 2" .....	1
U-BOLT, 2-1/2" .....	1
5/8", COMPRESSION CLAMP .....	10
NYLON TIES, LARGE 14.5" BLACK .....	10
COIL, #10 AWG 16 TURNS ON 3/4" FORM .....	1
ASSEMBLY MANUAL .....	1
ZINC PASTE (PENETROX OR NOALOX OR EQUIVALENT) CUPFULL .....	2
BALUN MOUNTING PLATE, 1/8 X 2 X 4-1/2" .....	1

## HARDWARE BAG #1:

NUT, 3/8-16, STAINLESS .....	16
NUT, 5/6-18, STAINLESS .....	4
LOCK WASHER, 3/8" SPLIT RING, STAINLESS .....	16
LOCK WASHER, 5/16" SPLIT RING, STAINLESS .....	4
THIMBLE, 1/4" ZINC .....	4
WIRE NUTS, 1/4 GALV. ....	8

## BAG #2:

BOLT, 1/4-20 X 5" HEX CAP, STAINLESS .....	2
BOLT, 1/4-20 X 3-1/2", STAINLESS .....	4
BOLT, 1/4-20 X 3", STAINLESS .....	8
BOLT, 1/4-20 X 2-3/4", STAINLESS .....	12
BOLT, 1/4-20 X 2-1/2", STAINLESS .....	18
BOLT, 1/4-20 X 2.0", STAINLESS .....	4

## BAG #3:

BOLT, 1/4-20 X 1-3/4", STAINLESS .....	2
BOLT, 1/4-20 X 1-1/2", STAINLESS .....	24
SCREW, 1/4-20 X 1" COUNTERSUNK, FLATHEAD, STAINLESS .....	14
NUT, 1/4-20 LOCKING, STAINLESS .....	64

## BAG #4:

SCREW, 8-32 X 2" PANHEAD, STAINLESS .....	10
SCREW, 8-32 X 1-3/4" PANHEAD, STAINLESS .....	10
SCREW, 8-32 X 1-1/2" PANHEAD, STAINLESS .....	20
SCREW, 8-32 X 1-1/4" PANHEAD, STAINLESS .....	28
SCREW, 8-32 X 1/2" PANHEAD, STAINLESS .....	10
NUT, 8-32, STAINLESS .....	10
NUT, 8-32 LOCKING, STAINLESS .....	72

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