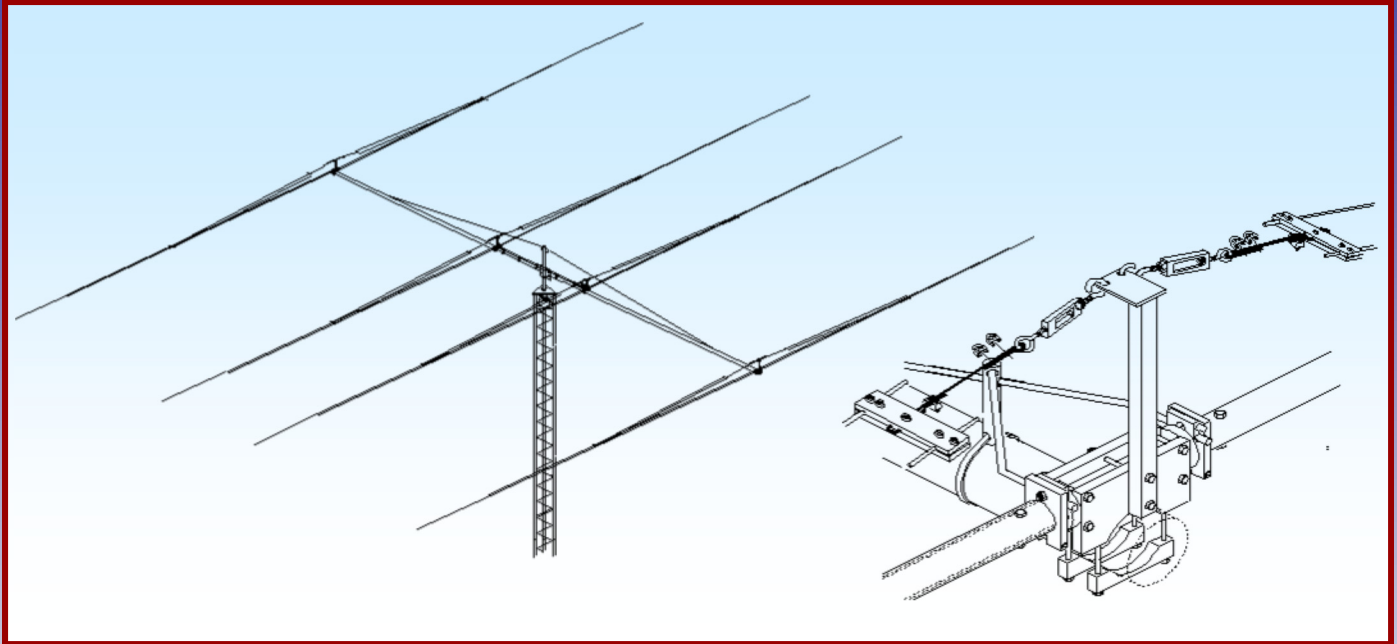




M2 Antenna Systems, Inc. Model No: 40M4LLDD



SPECIFICATIONS:

Model	40M4LLDD	Power Handling	3 kW, Higher avl.
Frequency Range	7.0-7.3 MHz	Boom Length / Dia	42' / 3.0 x .125 Wall
Gain	7.5 dBi	Element Length / Dia	51 Ft
Front to back.....	22 dB	Turning Radius:	33 Ft
Beamwidth	E=60°	Stacking Distance	Call
Feed type.....	Dual Driven	Mast Size	2" to 3" Nom.
Feed Impedance.....	50 Ohms Unbalanced	Wind area / Survival	13.0 Sq. Ft. / 100 MPH
Maximum VSWR	2.0:1 Max	Weight / Ship Wt.	142 Lbs. / 160 Lbs.
Input Connector	SO-239, Other avl.		

***Subtract 2.14 from dBi for dBd**

FEATURES:

The recently upgraded, computer optimized, linear loaded, dual driven 40M4LLDD gets the bandwidth and maintains performance across the band like no other 40 meter Yagi. This was a huge challenge requiring the latest techniques in computer optimization. Gain, Front to Back and VSWR are maintained nearly flat across the whole band! In addition, it is now better mechanically and easier to assemble. Only the tips of each element are different as all the linear loading settings are the same for each element. The shorting bars are now 2 piece, clamp type making solid long lasting connections. For foreign amateurs, two tuning options are available; FULL BAND and LOW END ACCENTUATED, but still broadband. The resulting design is head and shoulders above the competition in strength, durability and performance. This antenna has been designed to meet your crossband SSB contesting needs and give you years of enjoyment on the 40 meter band regardless of future band plan changes.

Mechanically, the elements are butt sleeved to withstand continuous winds of 100 mph or the constant battering of high winds. This antenna WILL frustrate Mother Nature! The Driven elements are split in the center and insulated with a solid 1-1/4" fiberglass rod. The parasitic element also have solid 1-1/4" center aluminum center section. The 3 kW continuous, 5 kW peak, 1:1 balun completes the package. All hardware is stainless or galvanized except the U-bolts. Options include parts to add 4 elements for 17 or 20 meters. Call for details.

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12/19/16
Rev.02

40M4LLDD ASSEMBLY MANUAL

BEFORE YOU BEGIN: Look over the DIMENSION SHEET, HARDWARE AND ELEMENT ASSEMBLY, PLUS ELEMENT OVERHEAD SUPPORT UPGRADE DRAWINGS to get familiar with the various parts of the antenna. Tools handy for assembly process: screwdriver, 11/32, 7/16, 1/2, 9/16 and 5/8" nut drivers, end wrenches and/or sockets, diagonal cutters, and measuring tape. ***Small containers 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. ELEMENT CLAMP BLOCK ASSEMBLY.

SEE "ELEMENT HARDWARE" drawing to aid in the assembly of this step. Start by assembling the four pairs of ELEMENT CLAMP PLATES together with 1/4-20 x 2-1/2" bolts to the four outer holes. NOTE THAT ONE SET OF CLAMP PLATES WILL ALSO GET A 1" X 1" X 6" ANGLE BRACKET FOR MOUNTING THE BALUN. Add the 1/4-20 locknuts finger tight.

A. FRONT & REAR DRIVEN ELEMENTS

On two of the element clamp plates assembled in the previous step, slip in the 1-1/4 X 24" fiberglass rods and rotate until the element mounting holes are vertical. ***Center the rod and tighten the hardware EVENLY, so the plates are parallel and the same amount of threads are showing through all the locknuts.*** Slide the POLYETHYLENE DISC INSULATORS onto both ends of the fiberglass rods and push them up against the clamp plates. The disc insulators can sometimes be a very tight fit on the rods. If you can't get them to fit place them in hot water a few minutes.

B. REFLECTOR AND DIRECTOR ELEMENTS

Slide the 1-1/4" x 24" **CENTER COUPLING ROD** into a CLAMP PLATE ASSEMBLY. Center the assembly and align the bolt holes to vertical. Tighten all four outer element clamp plate bolts EVENLY, starting with the two center bolts. Make sure plates remain parallel, top to bottom.

2. VERTICAL SUPPORT POST INSTALLATION (SEE ELEMENT SUPPORT UPGRADE)

The element clamps require a 1" SQ. X 24" WELDED VERTICAL SUPPORT POST to raise and support the linear loading lines and complete element assembly. Orient the WELDED PLATE over the element clamp plates.

3. HALF ELEMENT ASSEMBLIES

There are 8 half element assemblies. One pair each for the Reflector, Rear Driven, Front Driven, and Director Elements. See the ELEMENT ASSEMBLY drawing to aid in the assembly of each half element. Also refer to the DIMENSION SHEET and ELEMENT HARDWARE DETAIL drawings. Only the 1/2" element tip sections are different lengths. The correct hardware to join the various sizes are as follows:

For 1-1/2" to 1-1/4" tubing use 8-32 x 1-3/4" screws.

For 1-1/4" to 1" tubing use 8-32 x 1-1/2" screws.

For 1" to 1" and 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.

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.

A. Prepare the LINEAR LOADING ARMS (1" center hole) with one 8-32 x 1/4" Allen head SET SCREW. (5/64 Allen wrench supplied), one 8-32 x 1-1/2" screw and locknut. Slide a LINEAR LOADING ARM on each 1" section and position it next to the end screw. Then slide the **element overhead support clamp** up against the 8-32 x 1-1/4" screws head nearest the end. Align it per the ELEMENT ASSEMBLY SHEET and tighten the 8-32 hardware securely.

40M4LLDD ASSEMBLY MANUAL

B. Now slide the 1" tube sections over the 7/8 x 9" fiberglass rod insulators. Connect the two sections with 8-32 x 1-1/4" screws and locknuts. Orient the arms as shown and tighten the 8-32 x 1-1/2 screws and locknuts. Be sure the arms are up against the screws closest to the fiberglass rod. THIS IS IMPORTANT SINCE THE ARMS ARE USED FOR DIMENSIONING THE LINEAR LOADING SHORTING BAR POSITION LATER IN THE ASSEMBLY

C. Locate the 8 black plastic, 1" x 6" linear loading stabilizer bars. Attach them to the short 3/8" x 1-1/4" x 3" support arm with the 1 inch hole. Use 8-32 x 1" screws and locknuts. Slide these on the SHORT, one inch element sections and position about 3" in from the butt. Now attach the 1-1/4" x 60" element sections. Add the 8-32 x 1-1/2" screws and locknuts but do not tighten until the STABILIZER BAR AND ARM ASSEMBLY ARE IN THE FINAL POSITION. Orient the black stabilizer bar insulators perpendicular to the element coupling holes and the support arms. Secure with 8-32 x 1-1/2" screws and locknuts. Repeat for the other element halves.

E. Insert the 3/4 x 48" sections into the swaged 1" sections and secure with 8-32 x 1-1/4 screws and locknuts.

F. Following the DIMENSION SHEET and COMPRESSION CLAMP & TIP ASSEMBLY DETAIL SHEET add the 1/2" tip sections in pairs, noting that each element has different tip lengths. Secure with compression clamps.

G. As the outer element sections are being assembled, label each assembly as "REFLECTOR" , "REAR DRIVEN", "FRONT DRIVEN", or "DIRECTOR" (according to the 1/2" tips) to avoid mix ups.

4. REFLECTOR AND DIRECTOR ELEMENT ASSEMBLIES

See ELEMENT HARDWARE drawing.

Slide a 1-3/8" x 24" sleeve onto the 1-1/4" CENTER COUPLING ROD on one of the two ELEMENT CLAMP ASSEMBLIES, and align the 1/4" holes. Temporarily pin the sleeve as necessary. Carefully slide a 1-1/2" x 60" element section onto this assembly and align all holes. Insert a 1/4-20 x 2" bolt and tighten securely with 1/4-20 locknut. Repeat for the other element half. Now add the reflector or director element outer half element assembly completed in the previous step to the 1-1/2" sections using 8-32 x 1-3/4" screws and locknuts. Repeat for the other element halves.

5. PHASING LINE CLAMP BLOCK ASSEMBLY & INSTALLATION

See DRIVEN ELEMENT HARDWARE drawing.

First locate the phasing line clamp plates and clamp blocks. Apply a little zinc paste to each of the channels. Loosely assemble the plates to blocks, channel to channel, with 1/4-20 x 1" flathead screws and locknuts. Install a 8-32 x 2-1/4" screw and locknut in each clamp. Locate the remaining four 1-1/2" x 60" tube sections. Apply a little zinc oxide paste to the last inch of each butt end. Install a phasing line clamp assembly about 1/2" from the edge of the butt with small clamp plate oriented towards the element butt. Do not tighten the hardware at this time.

6. REAR & FRONT DRIVEN ELEMENT ASSEMBLIES

See ELEMENT HARDWARE drawing.

Slide a 1-3/8" x 24" sleeve onto each end of the two 1-1/4" fiberglass rods of the remaining element clamp assemblies and align the 1/4" holes. Carefully slide a 1-1/2" x 60" element section onto the two assemblies and align all holes. For both, insert a 1/4-20 x 2" bolt and secure with 1/4-20 locknuts. **BESURE TO INSTALL THE FRONT DRIVEN ELEMENT TIPS ON THE ELEMENT CLAMP PLATE ASSEMBLY WITH THE BALUN ANGLE BRACKET.**

40M4LLDD ASSEMBLY MANUAL

7. LINEAR LOADING ASSEMBLY – SEE ASSEMBLY DRAWINGS

- A. Install a pair of LINEAR LOADING RODS to each element half. Insert a rod through each STABILIZER INSULATOR BAR and then through a LINEAR LOADING ARM, allowing about 3/4" to extend beyond the arm. Install 8-32 x 1/4" Allen head screws to lock rods in place and add 3/16" shaft retainers for extra safety.
- B. Loosely assemble the LINEAR LOADING CLAMP PLATES (SHORTING BAR) pairs using 8-32 x 7/8" screws and locknuts.
- C. Slide one set of these shorting bars on the ends of the 3/16" linear loading rods. Measure and mark the position for the shorting bars. Move the bars to that location and tighten one screw to hold position. Insert a short section of BLACK PHILISTRAN CABLE (HPTG1200) through one hole, around strain relief and back thru other hole of shorting bar then add 3/16" cable clip to secure it.
- D. Align the rods and begin to tighten all the 8-32 x 7/8" screws and locknuts. Be sure the rods are parallel and have the same tension. Complete tightening the screws. Repeat for all the element halves.
- E. Place the element on a level surface with support post "up."
- F. Prepare eight (16) 1/4" HOOK AND EYE TURNBUCKLES by removing the hook end and running a 1/4-20 plain nut all the way to the hook. Now replace the hook end into the turnbuckle body and thread it in until just one thread shows inside the body of the turnbuckle. Now adjust the other end EYE of the turnbuckle until just one thread show inside the body.
- G. Install (8) 1/4" HOOK AND EYE TURNBUCKLES in the welded plates at the middle and at the top of the ELEMENT SUPPORTS. Install a CABLE EYE in the EYE of each turnbuckle and route the BLACK HPTG-1200 Philistran cable through the eye and back on itself. Review the element overhead support clamp upgrade detail for proper routing of the BLACK PHILISTRAN CABLE (HPTG1200) to lock the cable to the clamp. Tension the element overhead support line and linear loading assembly and secure the cable with two cable clips on each line as shown. Repeat for remaining elements.
- H. Now adjust the turnbuckles, adjusting so the inner sections are level and tighten the turnbuckle jam nuts. Element tips should droop about 4" to 8". The element will be more stable in the wind if you allow some droop to remain in the element.

Inspect each element for tight hardware and balanced tension on linear loading rods and element assembly supports. Minor tensioning adjustments can be accomplished using the turnbuckles.

8. BOOM ASSEMBLY

Use the BOOM HARDWARE drawing as a guide to assemble the boom. At this point it will be helpful to perform the remaining assembly steps with the antenna elevated off the ground (about 3 feet). This can be accomplished by using sawhorses or something similar. Wipe off the swaged ends of each boom section and apply a small amount of Penetrox. Insert the swaged ends of the two similar boom sections into either end of the straight piece. Align all of the holes, install the 1/4-20 x 3-1/2" bolts and locknuts, and tighten.

- A. Install the 3/8" EYEBOLTS to the outer ends of the boom, securing with stainless 3/8-16 nuts and lock washers. Align the eyes parallel with the boom and tighten.

9. Orient the boom with the eyebolts "up". Note the location of the REAR end of the antenna and parasitic elements as shown on the DIMENSION SHEET. 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 the reflector element. Repeat the same procedure for the other three elements.

40M4LLDD ASSEMBLY MANUAL

10. For ease of element installation, support the boom about 3' above ground, eyebolts "up." Place the reflector element on the boom. Loosely attach two BOTTOM CRADLES to the bottom of the clamp plates ON THE REFLECTOR AND DIRECTOR using the 1/4-20 x 2-3/4" bolts. (BE SURE TO USE ZINC PASTE ON THESE THREADS) Slide the back edge of the rear plate to your first mark. Level the reflector element and tighten all four bolts EVENLY and firmly. Repeat for the DIRECTOR on the other end of the boom.

11. Mount the TWO DRIVEN ELEMENTS assemblies in their respective positions, then attach the two bottom cradles and 1/4-20 hardware to each. After aligning these two elements with the reflector element, tighten the 1/4-20 bolts evenly and firmly.

12. Now take a step back for a moment to observe any misalignment (if any) and the "droop" in each element. Simply look down either the front or back of the boom to do this. If you have not already done so, adjust each turnbuckle until each element droops 6 to 10 inches at the tip. NOTE: The elements are the most stable in wind with a small amount of tip droop. ADJUST FOR LEVEL INNER SECTIONS. After the adjustments have been made, proceed with tightening the 1/4-20 JAMNUT on all the turnbuckles.

13. INSTALLING PHASING LINES - SEE ASSEMBLY DRAWINGS AND DIMENSION SHEET
Take the remaining Select two of the 3/16 x 132" PHASING LINE RODS and slide 5 Delrin PHASING LINE INSULATORS at least 1ft. onto the rods (they cannot be installed after rods are bent). Bend the rods as shown on the 40M4LLD PHASING LINE SHEET. Note that each phasing line crosses boom to feed an opposite element half.

14. Apply a little Penetrox to the phasing line tips and INSERT the lines into the grooved channels of clamp block assemblies on **Rear Driven element**. Push the lines through until at least 1/4" extends beyond clamp and then tighten the flathead clamp screws. Push the clamp block assemblies up next to disc insulators and tighten 8-32 x 2" clamp screws. Spread out the Delrin Standoff / spacers equally across the long central section of the rods, the two outside spacers next to the bends. SECURE THE STANDOFFS on the boom with the large nylon ties. Reshape bends if needed, so rods exit the standoffs and connect to clamps without stress or tension. Now repeat for Front Driven Element, but do not tighten clamp screw nuts until the balun is installed in the next step. Secure standoffs to boom with nylon ties.

15. 1:1 HF BALUN INSTALLATION

Mount the BALUN to the 1" x 1" x 6" angle bracket using a 2-1/2" U-bolt. DO NOT OVERTIGHTEN OR BALUN HOUSING COULD BE DAMAGED. Position assembly just forward of Front Driven element, connector pointing to rear and the leads easily reaching phasing line clamp block screw studs. Remove nuts from flathead screws, apply zinc paste to lead lugs, place on screw studs, and retighten nuts. Position leads to clear all metal objects by at least 1/4". Cut off any excess phasing rods that extend more than 1/4".

16. Attach the BOOM TO MAST PLATE at the balance point, using the two large 3" U-bolts, 3/8-16 stainless lockwashers, and nuts. Align plate to vertical and tighten nuts. For they should be attached in a way to allow the boom to be balanced on your tower / mast.

40M4LLDD ASSEMBLY MANUAL

17. 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 inch 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.

18. Check ALL hardware for tightness. Check ALL element sections, especially tip sections, for correct placement. Make any final adjustments to linear loading tension.

19. Attach the feedline section to the balun. Route towards the boom to mast plate. Secure at regular intervals with tape or nylon ties.

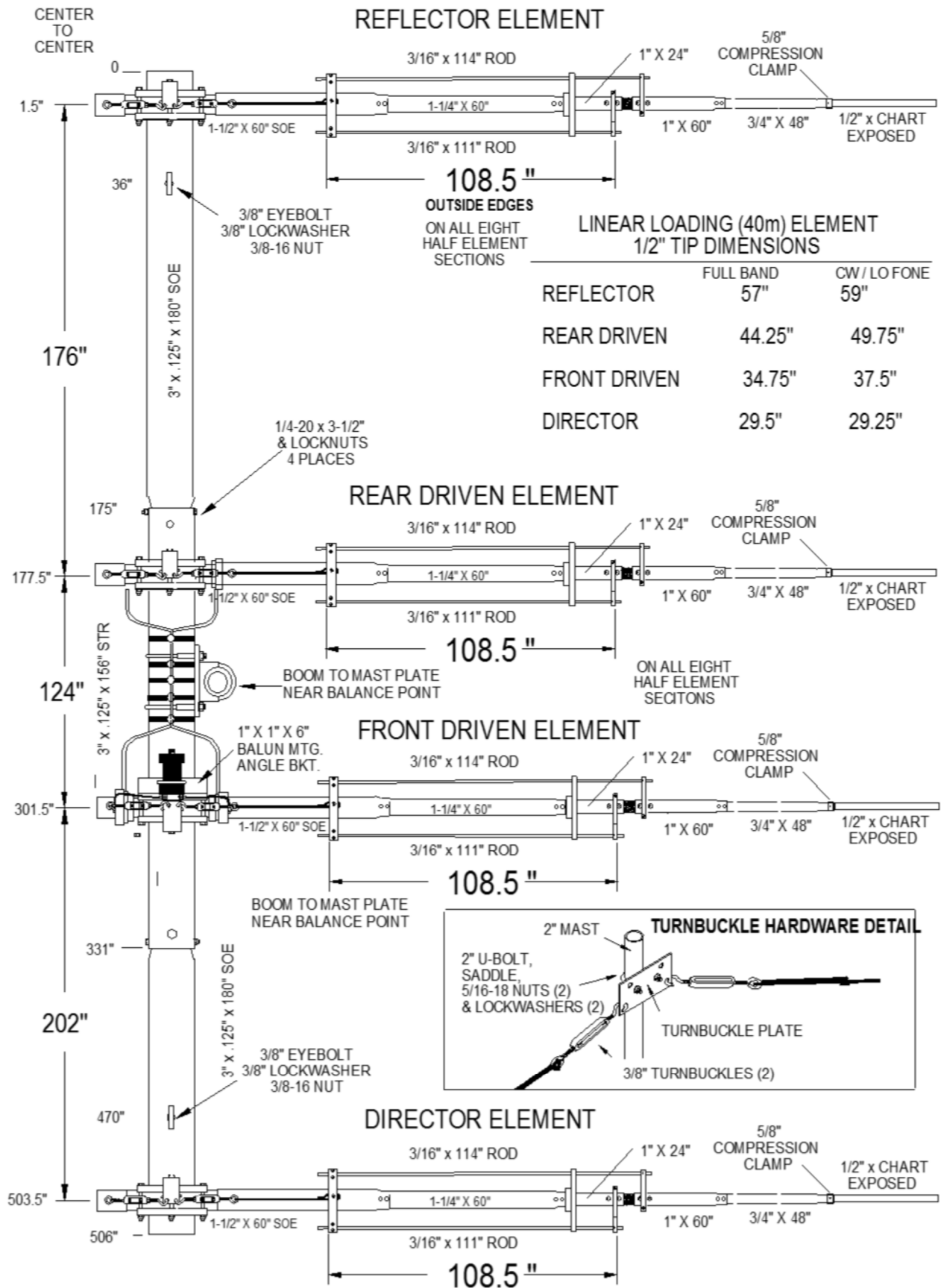
20. When mounting this antenna on a tower or mast with other antennas there may be interaction. In general VHF and/ or UHF antennas mounted for HORIZONTAL POLARITY should be at least 40 inches above or below the antenna. Use good quality 50 Ohm coaxial cable to feed the antenna and be sure your tower and rotator system can handle the wind loading and vertical weight of this antenna.

THIS COMPLETES ANTENNA ASSEMBLY

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40M4LLDD DIMENSION SHEET

ELEMENT SPACINGS



LINEAR LOADING (40m) ELEMENT
1/2" TIP DIMENSIONS

	FULL BAND	CW / LO FONE
REFLECTOR	57"	59"
REAR DRIVEN	44.25"	49.75"
FRONT DRIVEN	34.75"	37.5"
DIRECTOR	29.5"	29.25"

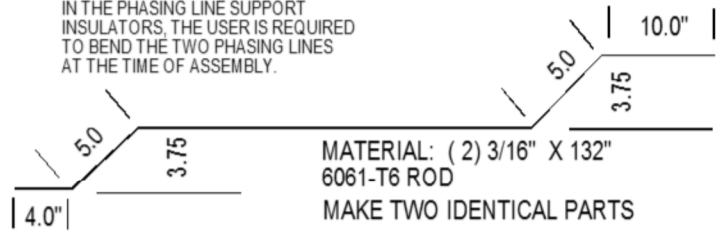
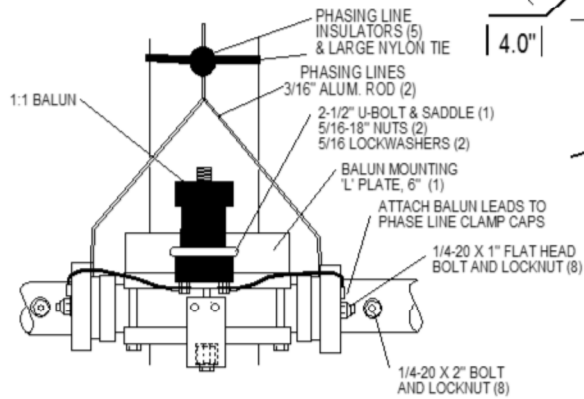
40M4LLDD ASSEMBLY DETAIL

40M4LLDD PHASING LINE

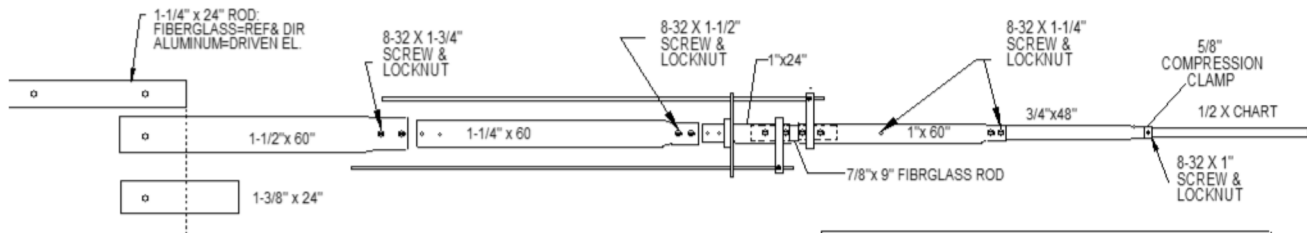
THIS 10" STRAIGHT SECTION
ALLOWS CLEARANCE FOR
BALUN MOUNTING.

BECAUSE OF THE BEND RADIUS
AND THE REQUIRED SMALL HOLES
IN THE PHASING LINE SUPPORT
INSULATORS, THE USER IS REQUIRED
TO BEND THE TWO PHASING LINES
AT THE TIME OF ASSEMBLY.

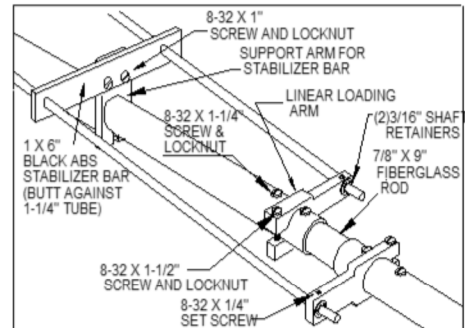
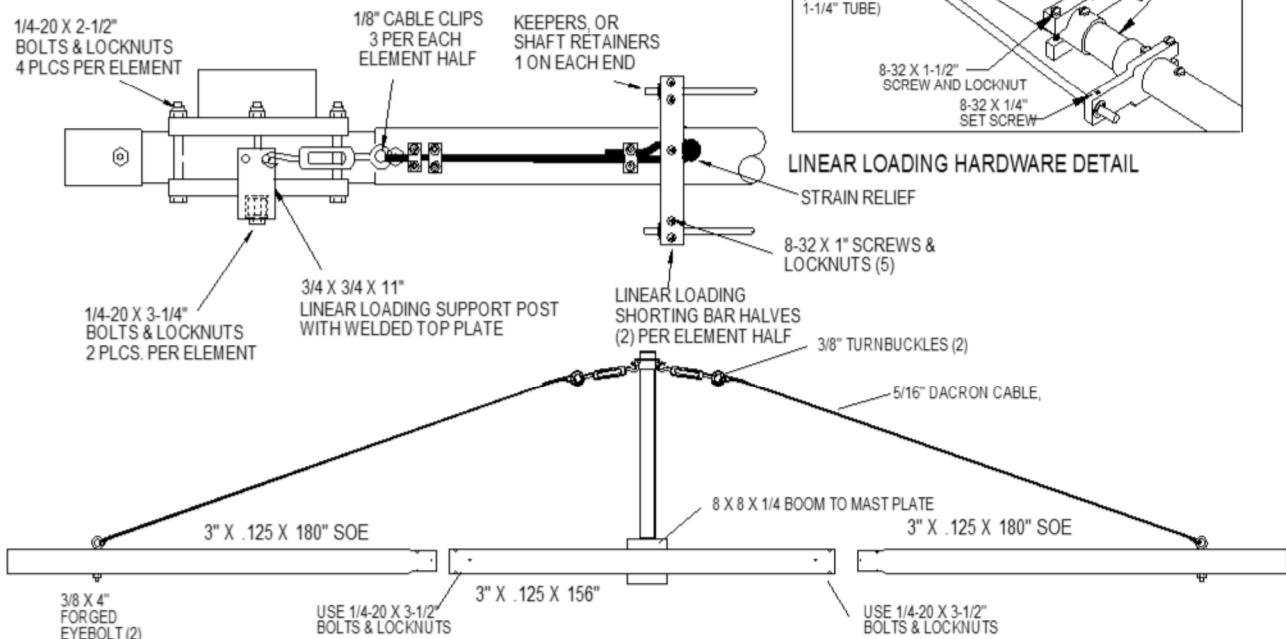
1:1 BALUN AREA TOP VIEW



ELEMENT ASSEMBLY

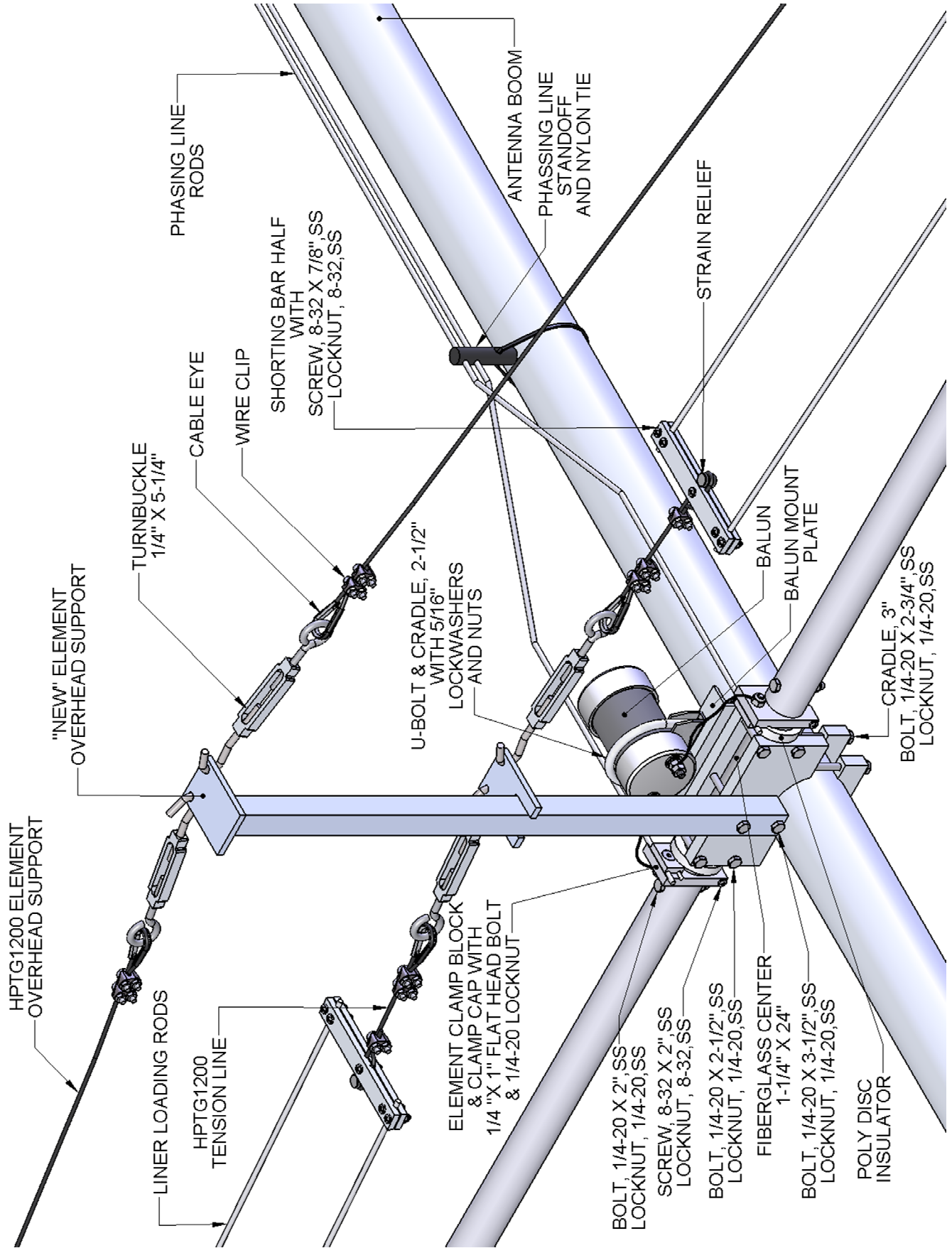


TOP VIEW - LINEAR LOADING/ELEMENT CLAMP HDWE

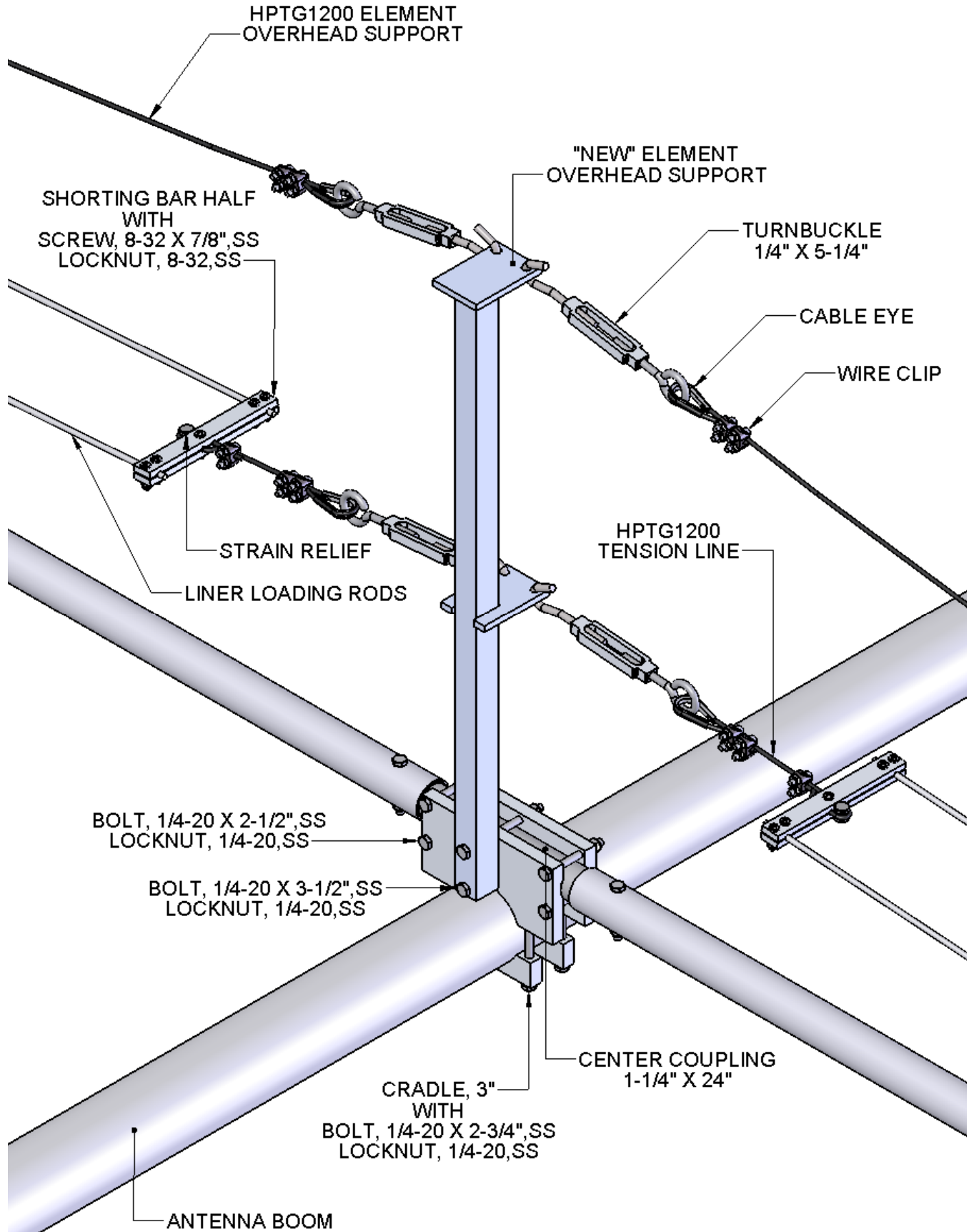


BOOM HARDWARE ARRANGEMENT

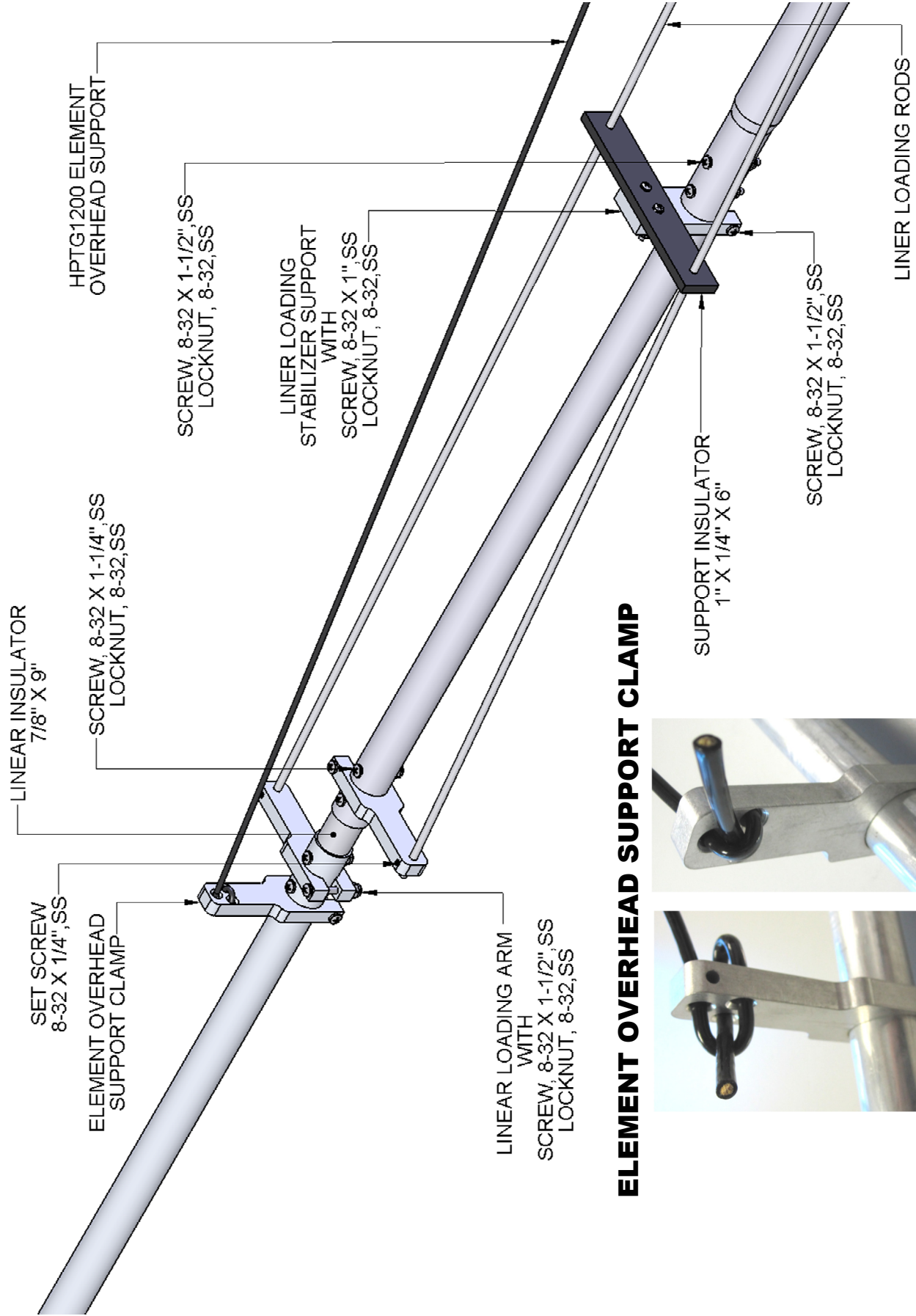
40M4LLDD D.E. ASSEMBLY



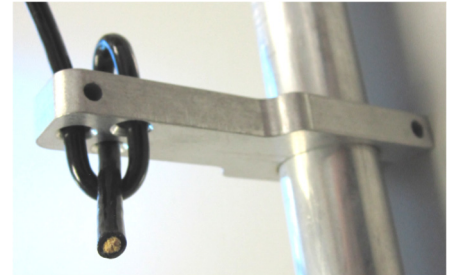
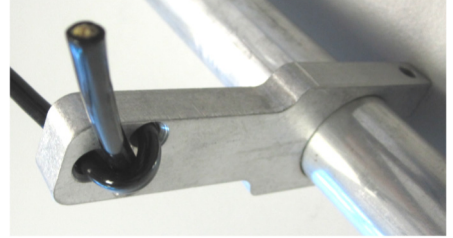
40M4LLDD REF/DIR ASSEMBLY



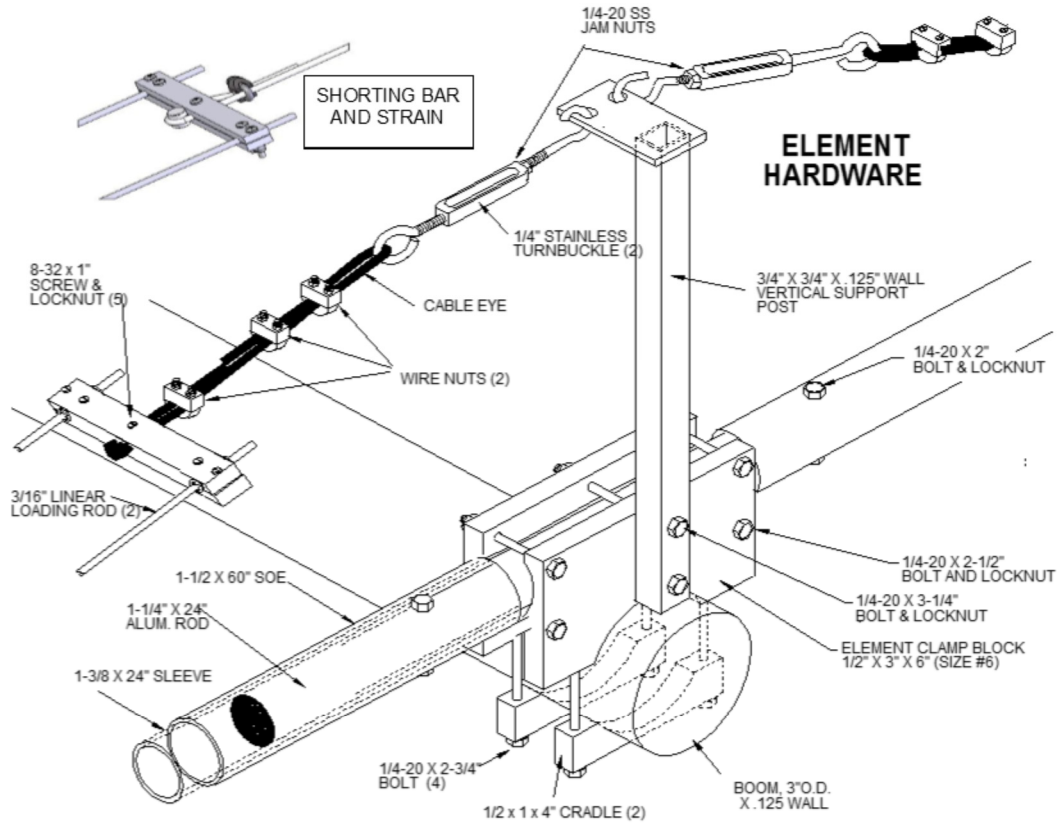
40M4LLDD LINEAR LAODING DETAIL



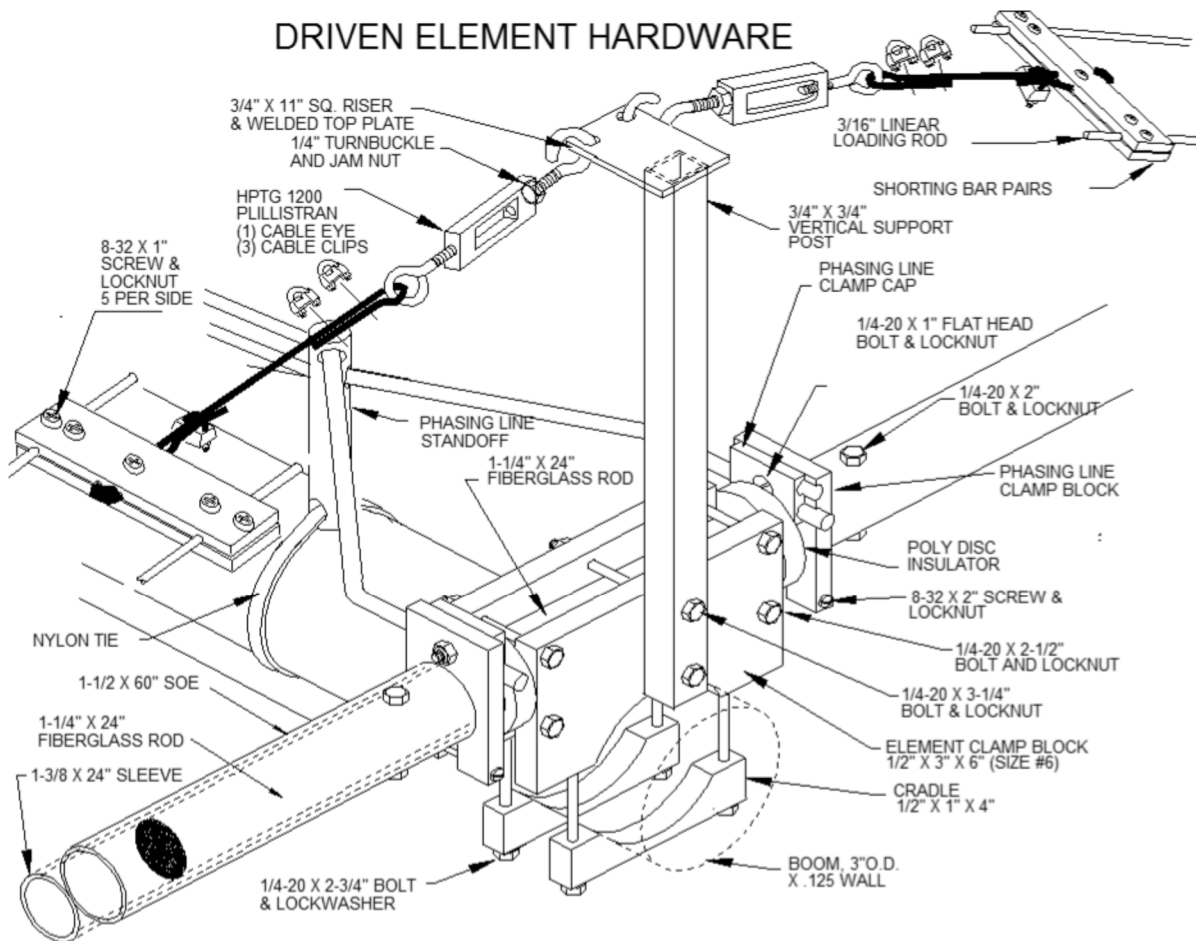
ELEMENT OVERHEAD SUPPORT CLAMP



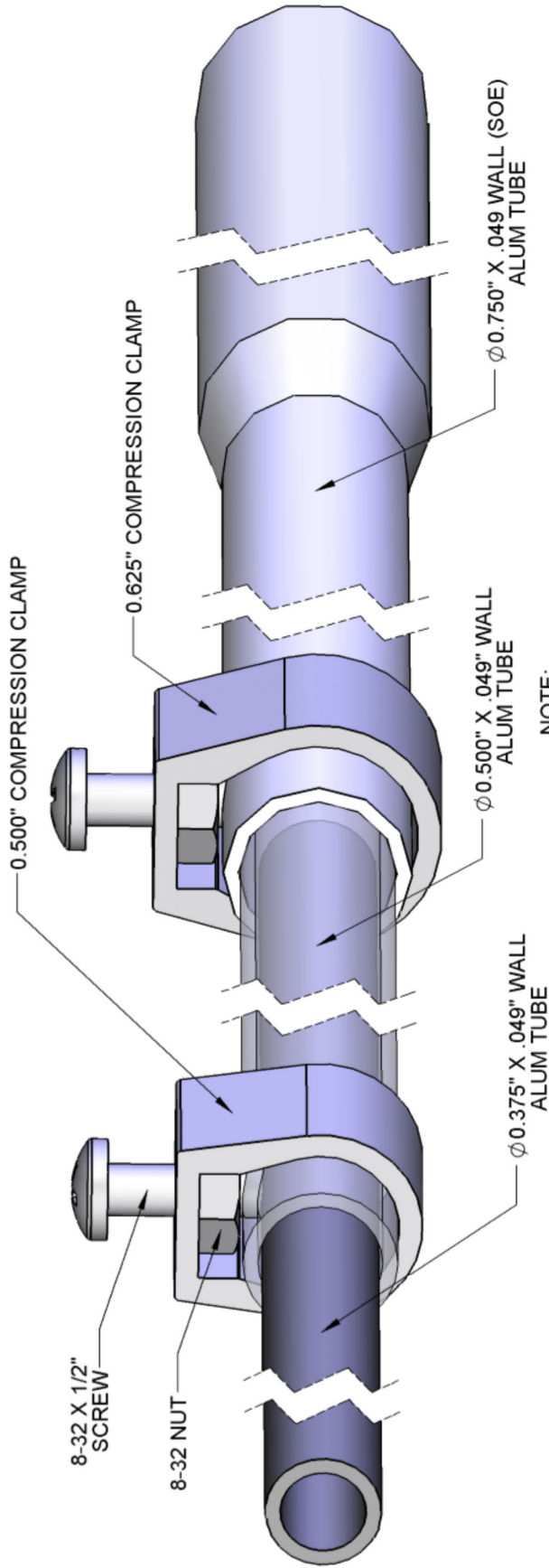
40M4LLDD ASSEMBLY DETAIL



DRIVEN ELEMENT HARDWARE

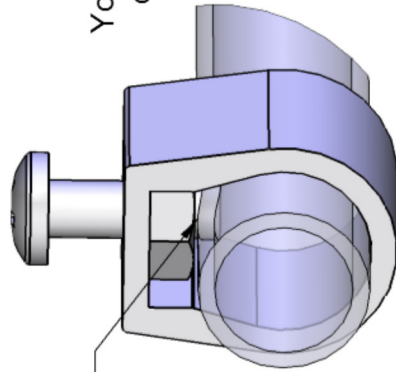


GENERIC COMPRESSION CLAMP DETAIL



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:
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: INSIDE TUBE NOT SHOWN FOR CLARITY

40M4LLDD PARTS & HARDWARE

UNBAGED ITEMS

DESCRIPTION	QTY
Assembly manual	1
Insulator, 1-1/4" x 24" fiberglass rod	2
Coupling, center 1-1/4" x 24" alum. Rod.	2
Boom to mast plate, 1/4" x 8" x 8" alum.	1
Balun, 1:1, 3-30 MHz.....	1
Support rope, 5/16" x 40ft. Dacron,	1
Tension Line, Phyllistrand 1200 HTPG, 44"	8
Support post, 1" x 1" x 24" SQ. Tube (M2AVR0050)	4
Element Overhead Support, HPTG1200 x 28'	4
Nylon ties, Large black.....	7
Zinc Paste (Penetrox, Noalox or equivalent) container.....	2

ALUMINUM TUBING

DESCRIPTION	QTY
Boom section, 3" x .125" x 180" SOE.....	2
Boom section, 3" x .125" x 156" STR.....	1
Sleeve, 1-3/8" x .058" x 24"	8
Element butt section, 1-1/2" x .058" x 60" SOE	8
Element section, 1-1/4" x .058" x 60" SOE	8
Element section, 1.0" x .058" x 60" SOE.....	8
Element section, 1.0" x .058 x 24".....	8
Element section, 3/4" x .049" x 48" SOE.....	8
Element tip section, 1/2" x .049" x SEE DIM SHEET"	8

ALUMINUM ROD

DESCRIPTION	QTY
Phasing line rod, 3/16" x 132" alum.	2
Linear loading rod 3/16" x 111" alum.	8
Linear loading rod, 3/16 x 114" alum.	8

BAG #1

Linear loading arm, 3/8" x 1-1/4 " x 3-3/4", alum. 1" hole.....	16
Element Overhead Support Clamp, 3/8" x 3-3/4".....	8

BAG #2

Insulator, stabilizer bar, 1/4" x 1" x 6" ABS.....	8
Support arm, for stabilizer bar 3/8" x 1-1/4" x 2-7/8", alum. 1" hole	8

BAG #3

Disc insulator, 3/8" x 2" polyethylene, 1-1/4" hole.....	4
Clamp Cap, Phase Line, 1/4" x 3/4" x 1-1/4" alum.....	4
Clamp Block, Phase Line, 3/8" x 1-3/4" x 2-5/8" alum., 1-1/2" hole	4
Phasing line insulator, 5/8" x 2-1/2", black Delrin.....	5

BAG #4

Shorting bar, 1/4" x 3/4" x 6"	16
Strain relief, 1/2 x 1/2 blk delrin.....	8

BAG #5, #6, #7 and #8

Saddle Clamp, 1/2" x 1.0" x 4" alum.....	8
Element Clamp plate, 1/2" x 3" x 6", 5/8" radius, alum #6.....	8

40M4LLDD PARTS & HARDWARE

BAG #9

Turnbuckle plate, 3/16" x 2" x 5", alum.	1
Balun mounting angle bracket, 1" x 1" x 6" alum.	1
Eyebolt, 3/8-16 x 6"	2
Turnbuckle, 3/8, hook and eye.....	2
Turnbuckle, 1/4-20 x 5-1/4", hook and eye	16

BAG #10

Fiberglass rod, 7/8" x 9" with 4 holes	8
--	---

BAG #11

U-bolt, 3"	2
U-bolt, 2-1/2"	1

BAG #12

U-bolt, 2", HD	4
U-bolt, 2".....	1

BAG #13

Nut, 3/8-16 stainless	16
Lock washer, 3/8" split ring stainless	14
Nut, 5/16-18, stainless	4
Lock washer, 5/16" split ring, stainless	4
Bolt, 1/4-20 x 3-1/2" stainless	12
Bolt, 1/4-20 x 2-3/4" stainless	16
Bolt, 1/4-20 x 2-1/2" stainless	16
Bolt, 1/4-20 x 2.0" stainless.....	8
Bolt, 1/4-20 x 1" Flathead, stainless.....	4
Nut, 1/4-20", stainless	16
Nut, 1/4-20 locking, stainless	40

BAG #14

Screw, 8-32 x 2" panhead, stainless.....	4
Screw, 8-32 x 1-3/4" panhead, stainless.....	16
Screw, 8-32 x 1-1/2" panhead, stainless.....	40
Screw, 8-32 x 1-1/4" panhead, stainless.....	48
Screw, 8-32 x 1.0" panhead, stainless.....	64
Screw, 8-32 x 1/2" panhead, stainless.....	8
Nut, 8-32 locking, stainless	180
Nut, 8-32, stainless	8
Cable Clips, 1/8".....	48
Small Cable Eyes, 3/16".....	16
Compression clamp 5/8"	8

BAG #15

Set screw, 8-32 x 1/4" stainless	16
Shaft retainer, 3/16" stainless	32
Push tube 3/8" x 3" alum.....	1
Allen wrench 5/64"	2

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40M4LLDD TUNNING CHART

THE FOLLOWING CHARTS SHOW THE GAIN, FRONT TO BACK AND VSWR FOR THE TWO SETS OF TIP DIMENSIONS SHOWN ON THE DIMENSION SHEET.

FOR FULL BAND COVERAGE:

FREQ.	7.0	7.05	7.1	7.150	7.2	7.25	7.3
GAIN	7.65	7.38	7.17	7.07	7.09	7.21	7.45
F/B	12	19.5	23.8	22.7	19.5	16.7	14
VSWR	1.7	1.2	1.1	1.1	1.1	1.3	1.9

FOR BETTER F/B AND VSWR ON THE LOW END OF THE BAND:

FREQ	7.0	7.05	7.1	7.15	7.2	7.25	7.3
GAIN	7.4	7.1	7.0	7.0	7.0	7.1	7.3
F/B	16.1	23.7	22.1	21.3	20.2	17.8	15.1
VSWR	1.3	1.04	1.1	1.2	1.3	1.7	2.5

Note: the gain is in dBi in free space. With the ground gain factor add approximately 5.4 dB so 7.4 dBi free space would translate to 12.8 dBi

40M4LLDD ANTENNA PLOTS

