

# Installation Instructions, Light Beam Antenna Series

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The Light-Beam antenna is a compact, computer optimized, directional antenna with good gain and excellent front to back ratio. The antenna has been optimized for operation at about 30 ft above ground.

**Please read these Installation Instructions, completely, prior to the antenna installation being started.**

## Check Your Delivery

Your Light Beam antenna has been shipped in two (2) boxes. Carefully inspect the packaging for damage then unpack the antenna and note any shipping damage. If any damage is found, contact the shipping carrier for insurance coverage.



The long fiberglass and plastic parts as well as the boom are shipped in one box. The End Plate Assemblies, wire bundles and hardware are in the other box.

Locate the hardware parts bag and wire bundles.

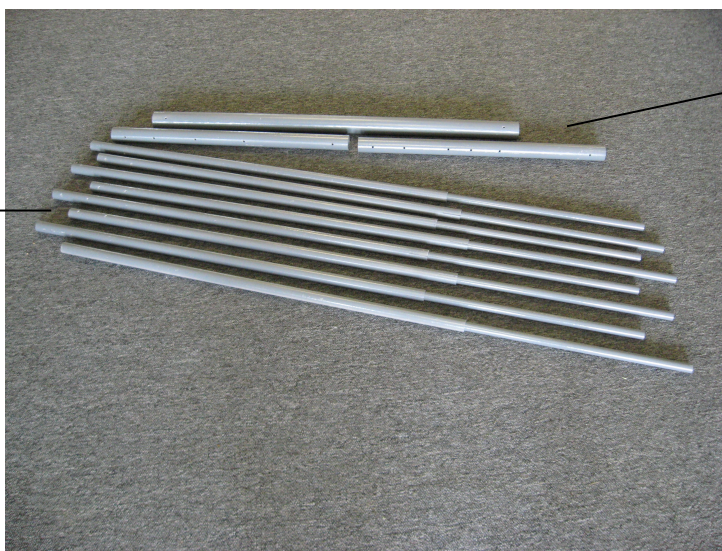


Check the hardware and wire assemblies against the parts list below to assure the proper quantities of parts are included. Refer to the parts picture page to identify the hardware. Next, check the long fiberglass, plastic parts, the boom and the End Plate Assemblies against the parts list to assure all of these parts are present. If any parts are discovered missing, please contact us immediately for replacements.

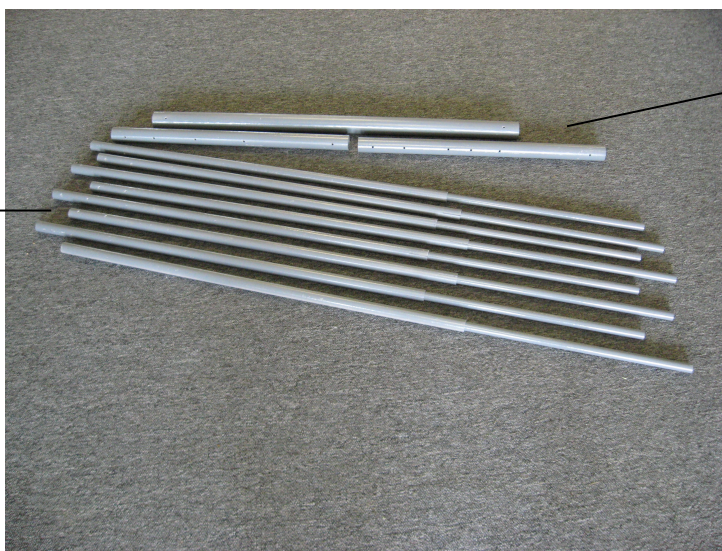
<b>Part Name</b>	<b>Quantity</b>
Spreader Assembly.	<b>8</b>
Boom Assembly. with 2 Boom Extensions	<b>1</b>
End Plate & Hub Assembly.	<b>2</b>
Wire Assembly, 12 AWG Insulated, Gray – 4 terminal	<b>1</b>
Wire Assembly, 12 AWG Insulated, Gray – 2 terminal	<b>5</b>
Element End Spacer	<b>2</b>
10-24 x 1/2" SS Pan Head Phillips Machine Screw	<b>14</b>
10-24 x 1.5" SS Machine Screw	<b>18</b>
10-24 x 2.0" SS Machine Screw	<b>2</b>
10-24 SS Anti Vibration Nut	<b>32</b>
10-24 SS Hex Nut w/Tooth Washer	<b>16</b>
2.0" Copper Shorting Strip	<b>4</b>
1.0" SS Hose Clamp	<b>8</b>
Tube End - Wire Spreader	<b>8</b>
No. 10 Ring Terminal	<b>2</b>
Wire Spacer - 2.0"	<b>5</b>
5-9/16" Black Nylon Cable Tie	<b>75</b>
Feed-line Support Tube	<b>1</b>
Feed-line Terminal Plate	<b>1</b>

## Parts Pictures

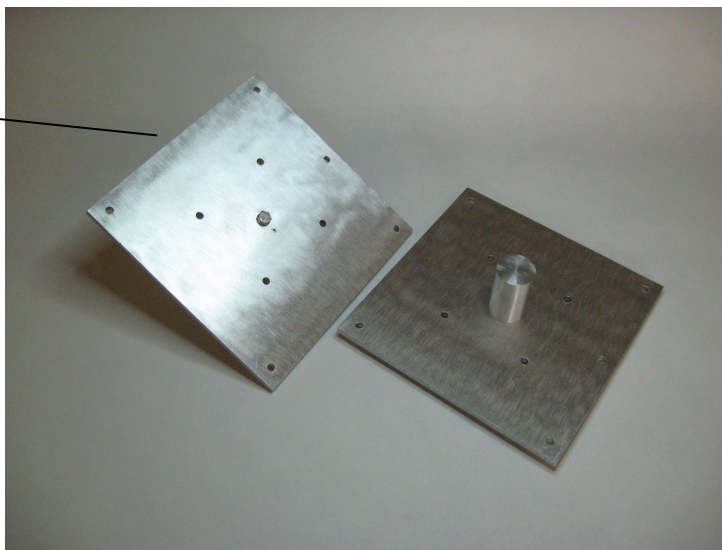
Spreader  
Assembly –  
Qty 8



Boom Assembly  
with Two (2)  
Boom Extensions



End Plate and  
Hub Assembly  
Qty - 2



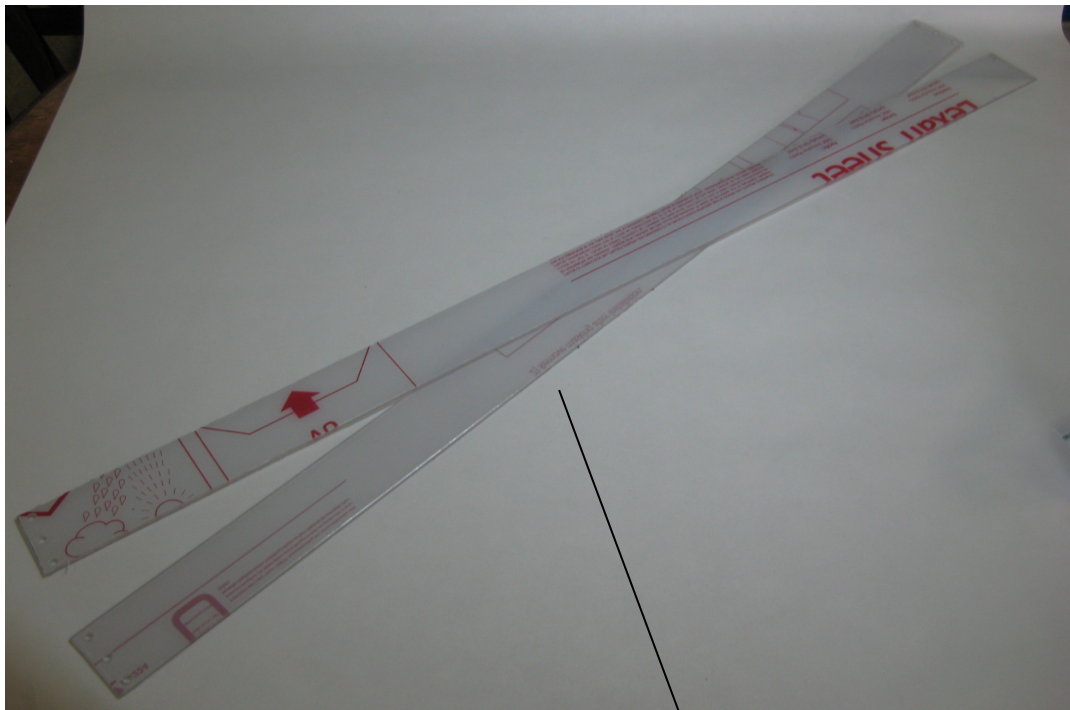


## Parts Pictures (continued)



Wire Assembly,  
4 Terminal  
Qty 1

Wire Assembly,  
2 Terminal  
Qty 5



Element End Spacers -- Qty - 2

## Parts Pictures (continued)

10-24 SS Machine Screw Nut  
with Locking Washer – Qty. 16

10-24 Anti-Vibration Nut –  
Qty. 32

10-24 x ½" SS Machine Screw – Qty. 14

10-24 x 1-½" SS Machine Screw – Qty. 18

10-24 x 2" SS Machine Screw – Qty. 2

1" SS Hose Clamp – Qty. 8



2" Wire Spacer – Qty. 5

Feed-line Terminal Plate – Qty. 1

2" Copper Shorting Strip –  
Qty. 4

## Parts Pictures (continued)



Tube –End  
Wire Spreader  
Qty. 8



5 – 9/16 " Black  
Wire Tie  
Qty. 75

Feed-Line  
Support Tube  
Qty. 1



No. 10  
Ring Terminal  
Qty. 2



## **Tools Required**

Only 5 tools are required to assemble your Light Beam Antenna:

- Tape Measure
- #2 Phillips head screwdriver.
- A 3/8" combination (box and open end) wrench
- A 5/16 " Nut Driver or Open end wrench
- Side Cutters





## **DANGER – Antenna Assembly**

**Failure to heed these warnings could result in serious injury or death**

While assembling your antenna you will be handling large structures. Caution must be used when moving these assemblies. Be aware of your surroundings and move all large assemblies slowly and with care.

## **DANGER – Antenna Installation**

If you are installing your antenna on a roof, tower, or other high structure or will use a ladder or scaffold to access the installation location, follow these precautions to prevent personal injury or death:

- Walk only on sound roof structures.
- Make sure the antenna assembly and installation surface are structurally sound so that they can support all loads (equipment weight, ice, and wind).
- Use safety equipment (for example, a safety harness and lifeline) appropriate for the work location.
- Perform as many procedures as possible on the ground. Do not attempt to assemble the antenna on a roof or tower.
- To avoid electric shock, stay at least 20 ft from overhead and adjacent power lines.
- If any part of the antenna or mount assembly comes in contact with a power line, call the local power company to remove it. Do not try to remove it yourself.

**Failure to heed these warnings could result in serious injury or death.**

## **Part Preparation**

Prior to beginning antenna assembly, it will be necessary to remove the protective tape from the plastic parts as shown in the photos below.



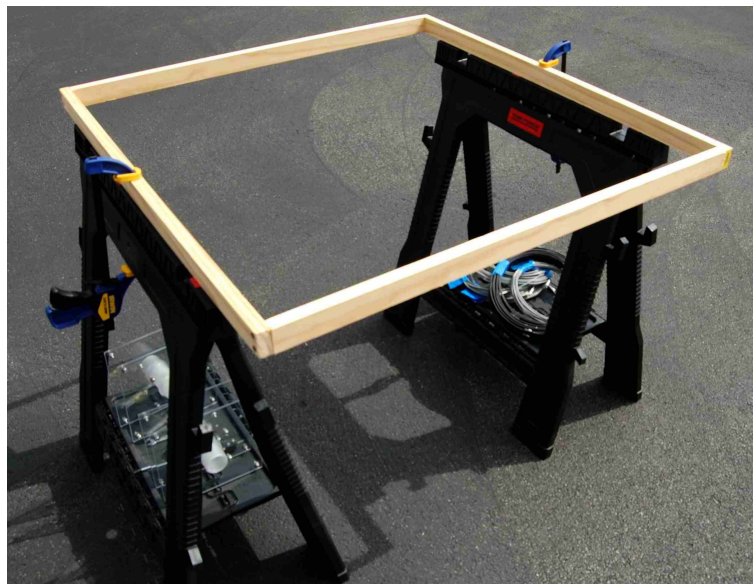
## **Assembly Overview**

We will now begin assembling the Light Beam antenna. This process consists of first attaching the driven element spreader tube assemblies to the driven element End Plate & Hub Assembly to form a large “X” structure that supports the driven element wires. The Feed-line Support Tube is then attached. The driven element wire assemblies are then strung around the driven element support “X” with the Feed-line Terminal Plate and Tube End-Wire Spreaders to form the driven element assembly. In similar fashion, you will then construct the director assembly by attaching spreader tube assemblies to the director End Plate & Hub Assembly. Then placing the director wires around the director support “X”, attaching the wires to the Tube End Wire Spreaders and attaching the wire ends to the director Element End Spacer. Finally, the driven element and director assemblies are placed on the boom and secured in place. Then feed-line is attached thereby completing the antenna assembly.

### **Step by Step Instructions**

As you progress – check off each step in the [ ✓ ] box provided.

An assembly stand made of a wooden frame on some table height supports, as show below, makes a convenient aid in completing the antenna assembly.

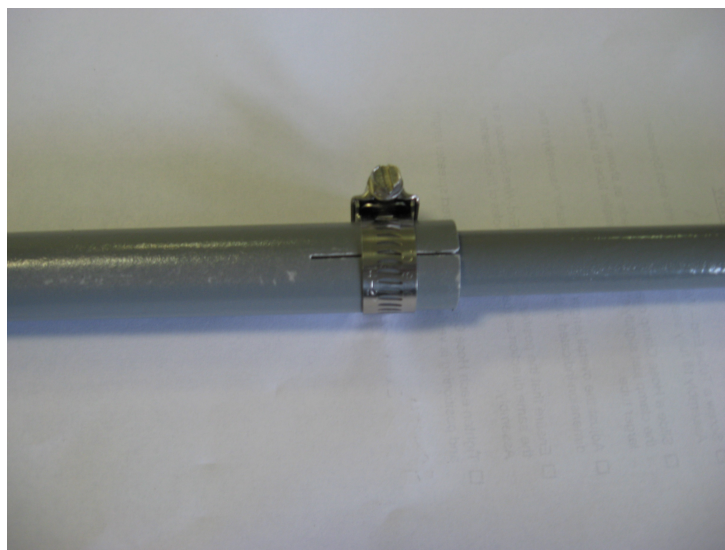


## **Driven Element Assembly**

- ☐ Screw a Tube End – Wire Spreader into each Spreader Assembly tube till fully seated.

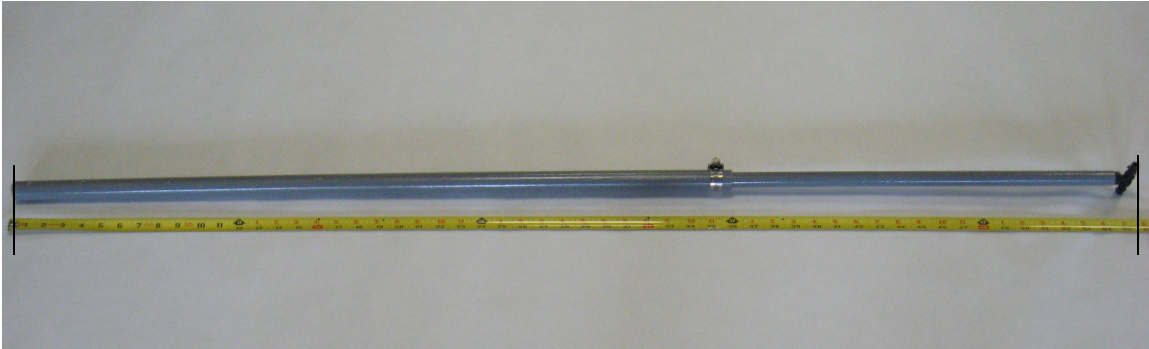


- ☐ Slide a Hose Clamp over each Spreader as shown. Tighten the clamp just slightly allowing the smaller tube to slide in the larger tube.





- Adjust the overall length of each Spreader Assembly, for your antenna model, to the dimension indicated in the table below.

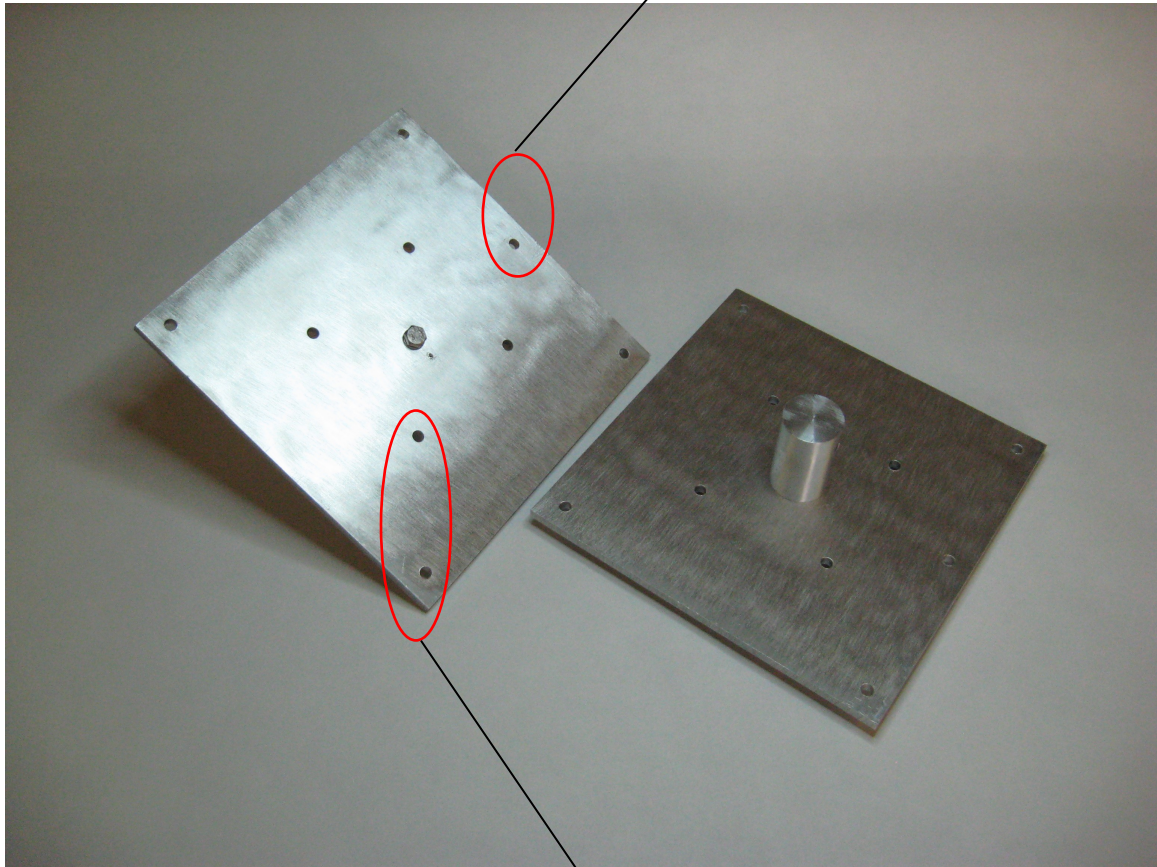


Antenna Model	Overall Spreader Assembly Length (inches)
LB-20M	78.0"
LB-17M	61.0"
LB-15M	52.5"
LB-12M	44.0"
LB-10M	38.5"

- Ensure that the position of the Tube End-Wire Spreader is in the same direction as the mounting holes of the Spreader Assembly.

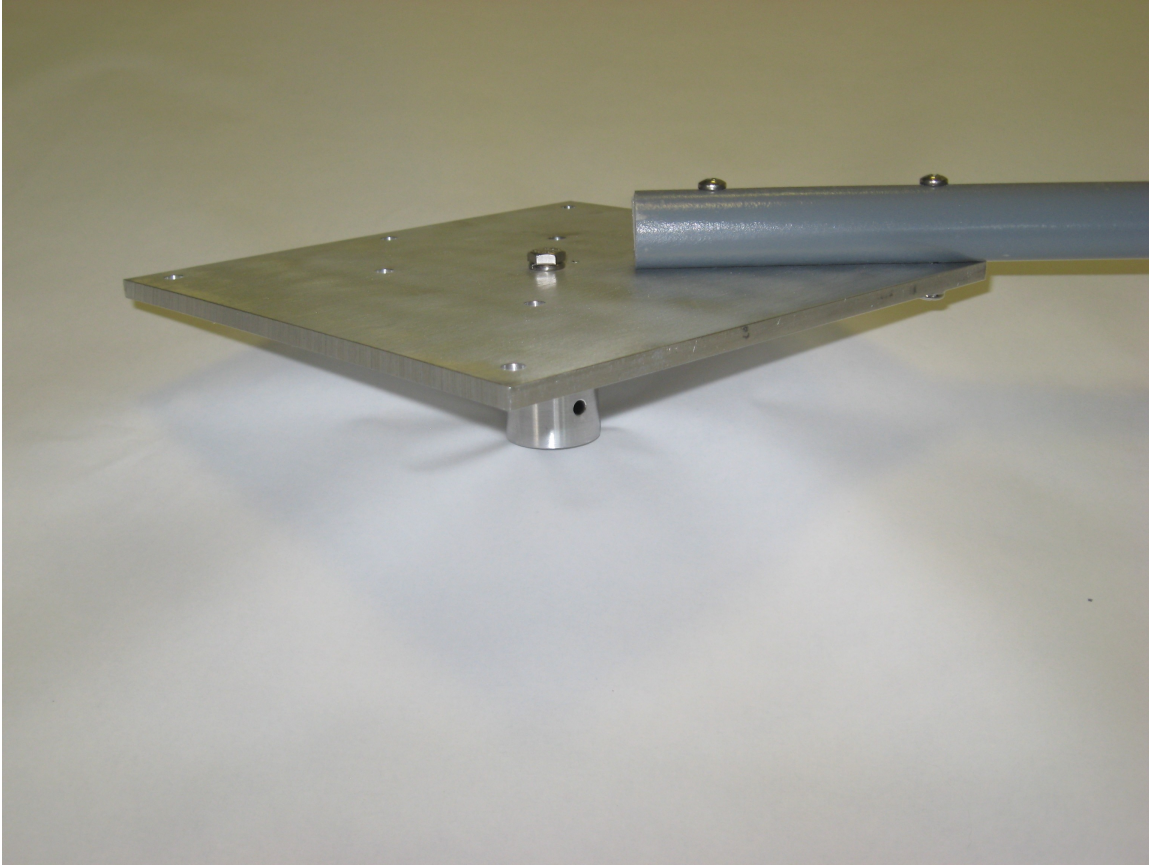


- Tighten each Hose Clamp after the correct spreader length and positioning is verified as correct.
- Locate one of the two End Plate & Hub Assemblies. See the picture below – note the one (1) additional hole in the end plate of this assembly. In a later step, this hole is used to mount the Feed-line Support Tube.



Spreader Assembly Mounting Holes

- Using 10-24 x 1.5" SS Machine Screws and 10-24 SS Anti Vibration Nuts, attach each tube to the End Plate & Hub Assembly.



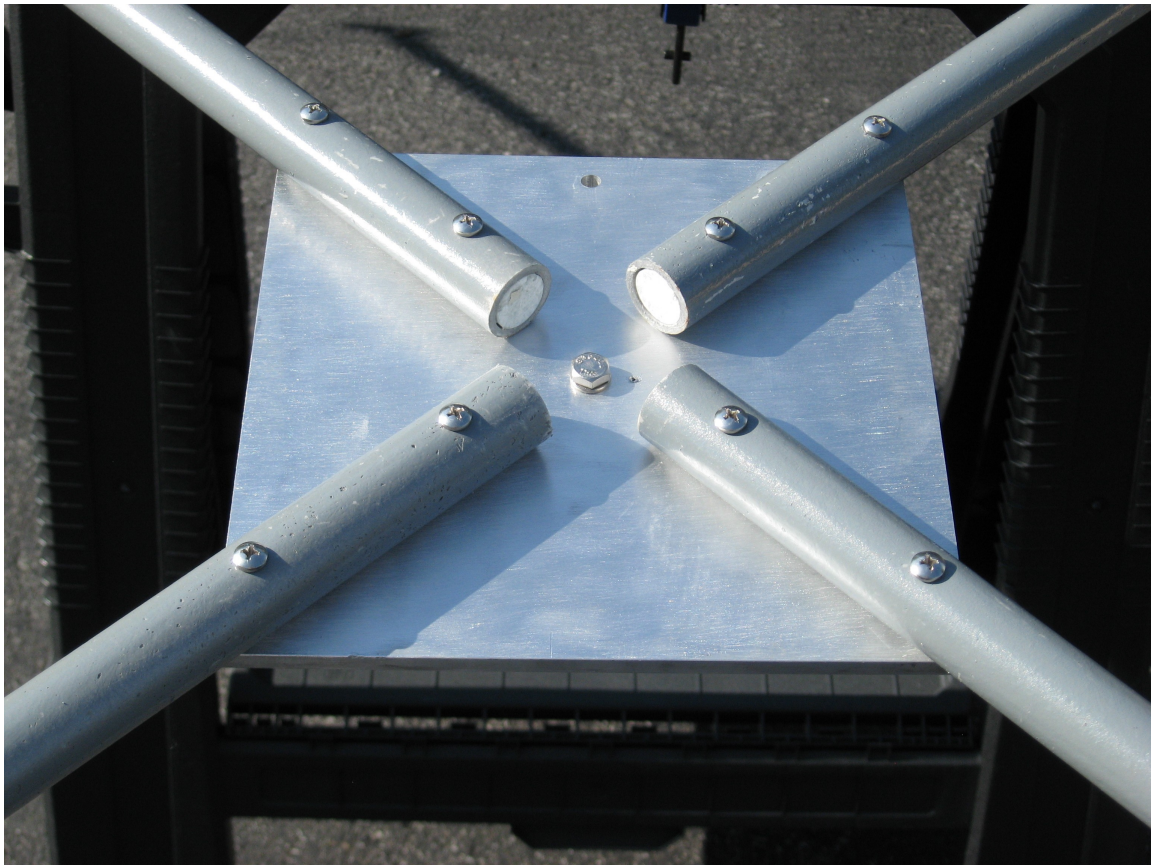
- Attach each of four (4) completed Spreader Assemblies to each of the End Plate & Hub Assemblies. Tighten each screw finger tight.



- Place one of the Element Support “X” Assemblies on your work surface. Align the elements diagonally to form a straight line and then tighten the hardware.



- Ensure that all hardware is firmly tightened.





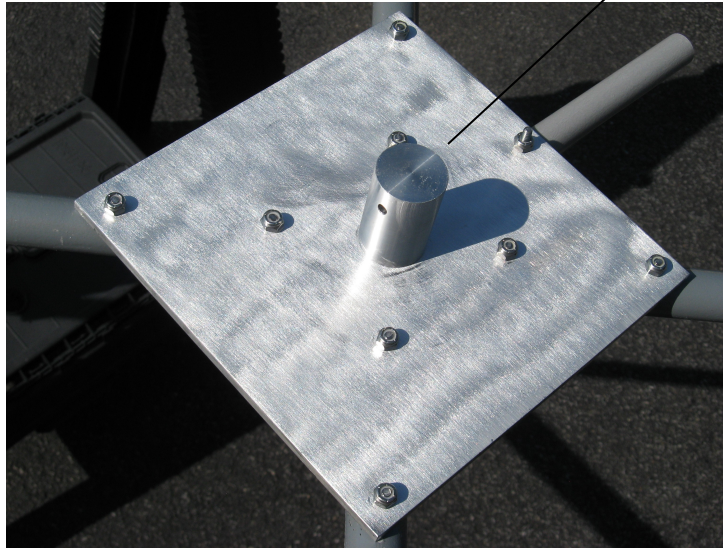
- Using a 10-24 x 1.5" SS Machine Screw and a 10-24 SS Anti Vibration Nut, attach the Feed-Line Support Tube to the "Driven Element Support 'X' Assembly".



**NOTE:**

**The Feed-line Support Tube points up to the top of the Driven Element where the Feed-line Terminal Plate is positioned in the steps that follow.**

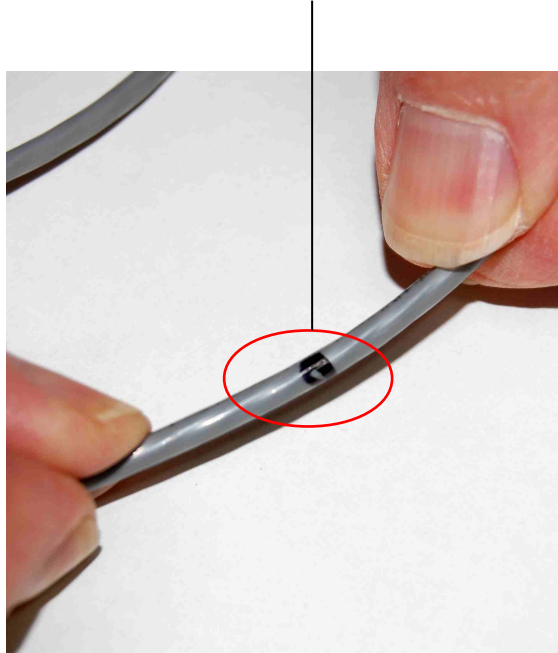
- Lift the Driven Element Support “X” Assembly from your work surface and turn it over to position the Hub on the End Plate & Hub Assembly on the top, as shown



- Insert a 5-9/16” Black Nylon Cable Tie in the top 2 holes of the Tube End-Wire Spreader of each Spreader Assembly of the Driven Element Support “X” Assembly.



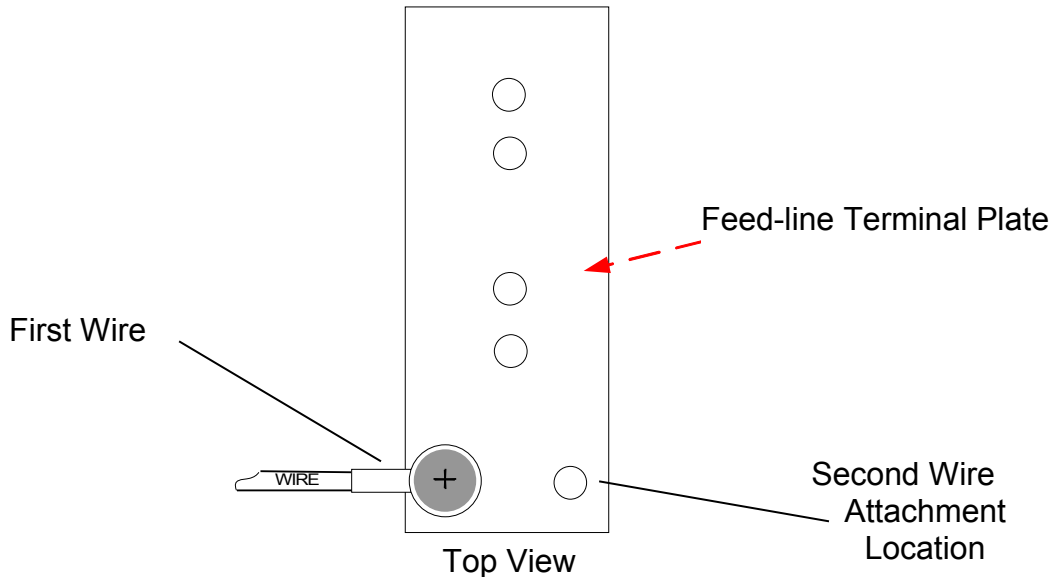
- Locate the Driven Element Wire Bundle that has 4 terminals. Opening the bundle will produce 2 wires with terminals at each end. You will find a black mark at 2 places on each wire.



- Bend the wire sharply at each of these black marks on both wires as shown.



Note that each wire now has a longer wire end section extending beyond one of the bends. Attach the longer end section of one wire to the left hole of the Driven Element Feed-line Terminal Plate as shown using a 10-24 x 1/2" SS Machine Screw. Position the wire terminal so it is at 90 degrees to the plate and use no washer – the terminal serves as the washer in this case. Place a 10-24 SS Hex Nut w/ Tooth Washer on the screw.

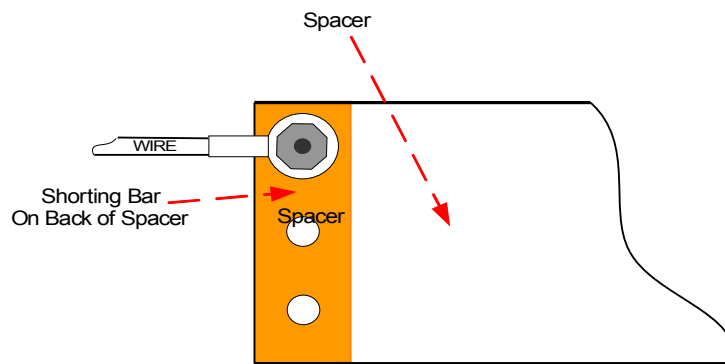


- ☐ Repeat the previous step and attach the second wire on a screw that is then passed through the hole on the right. Be sure to attach the longer wire end section to the Feed-line Terminal Plate.
- ☐ Position the Feed-line Terminal Plate and wires so the screw terminals are at the top as shown in the photo below.

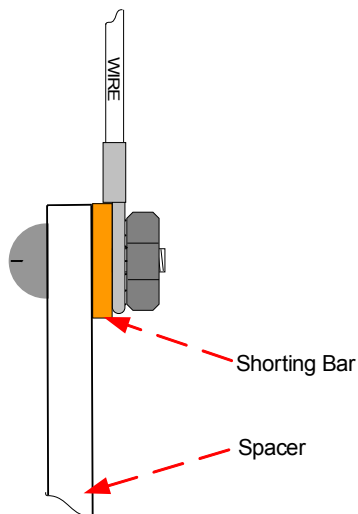




- ❑ Position the Feed-line Terminal Plate at the top position of the Driven Element Support “X” Assembly with the Feed-line Support Tube pointing to the Feed-line Terminal Plate.
- ❑ Route the wire around the Element Support “X” through the top cable ties to the opposite side of the Element Support “X”. Do NOT tighten each cable tie. Only partially close each cable tie as the wire is passed through.
- ❑ Locate an Element End Spacer. Position the terminal to be at 90 degrees to the spacer. Using a 10-24x1/2” SS Machine Screw, a Copper Shorting Strip and a 10-24 Hex Nut w/Tooth Washer to fasten the wire to the top hole of the Element End Spacer as shown.



Wire to Spacer Connection  
Side View



Wire to Spacer Connection  
Top View

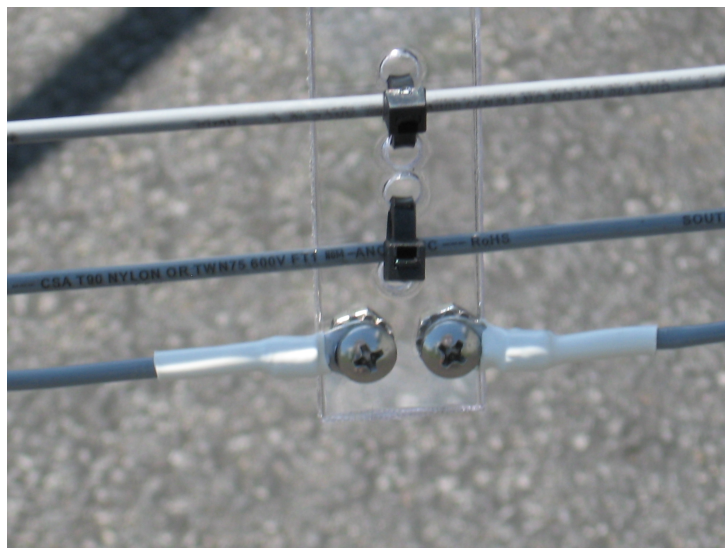
- ☐ Repeat the steps on the previous page when attaching the second wire from the Feed-line Terminal Plate. Route the wire through each cable tie and attach the wire terminal to the remaining top hole of the Element End Spacer.
- ☐ Align the black mark on the wire with each Tube End – Wire Spacer. Now tighten the cable tie to secure the wire to the Spreader Assembly. Clip off the excess cable tie.



- ☐ Insert a 5-9/16" Black Nylon Cable Tie in the center thru-holes of the Tube End-Wire Spreader for each Spreader Assembly of the Driven Element Support "X" Assembly.



- ❑ Locate a Wire Assembly having only 2 terminals each. Open the bundle and locate the black marks on these wires and bend them as previously described.
- ❑ Using a 10-24x1/2" SS Machine Screw and a 10-24 SS Hex Nut w/tooth washer, attach one of the wire terminals to either center hole in the Element End Spacer, route the wire around the Driven Element Support "X". When passing a Tube End – Wire Spreader, loop the cable tie AROUND the wire and tighten the cable tie. Continue routing the wire around the Element Support "X" and loop the cable tie AROUND the wire as done previously. Secure all 4 corners of the "X". Attach the remaining terminal to the center hole located on the opposite end of the Element End Spacer. Be sure that the shorting bar is in place.
- ❑ Locate another 2 terminal Wire Assembly . Attach this wire to the bottom (remaining) hole in the Element End Spacer, route it around the Element Support "X" as previously described and secure with cable ties as done previously. Attach the wire terminal to the bottom hole at the opposite end of the Element End Spacer. Be sure that the shorting bar is in place. Clip off all cable tie excess.
- ❑ Using 2 black cable ties, attach each of the wires to the Feed-line Terminal Plate as shown. Clip off the cable tie excess.

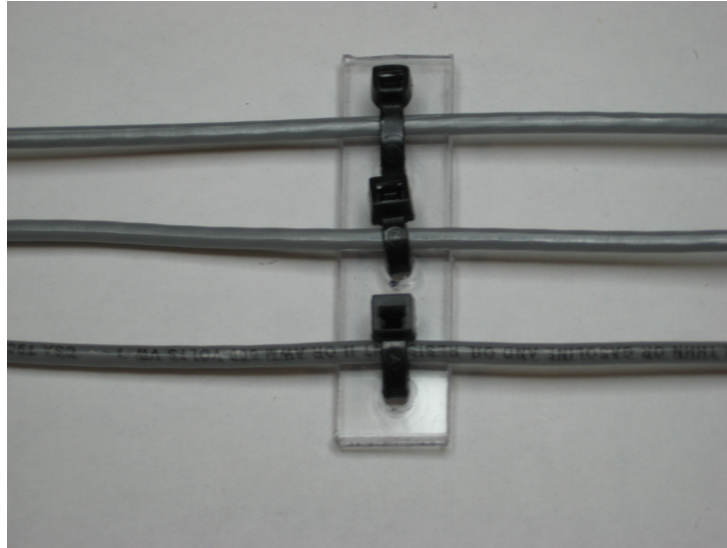


**NOTE:**

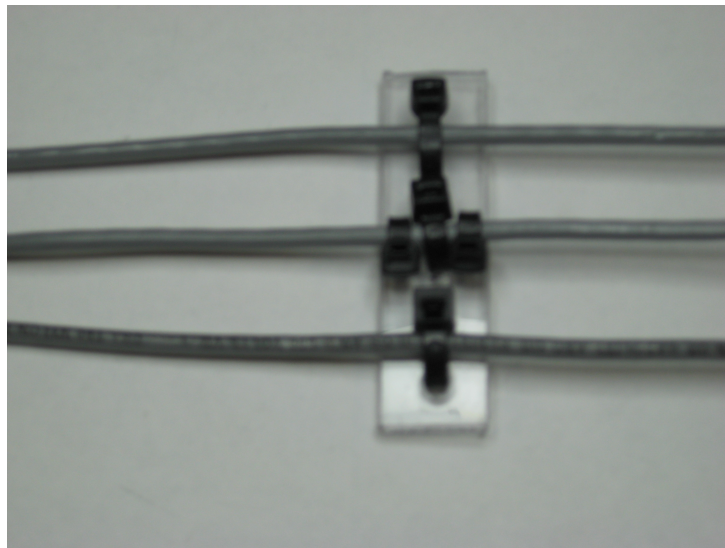
This photo is inverted.

The Terminals of your installation are at the top.

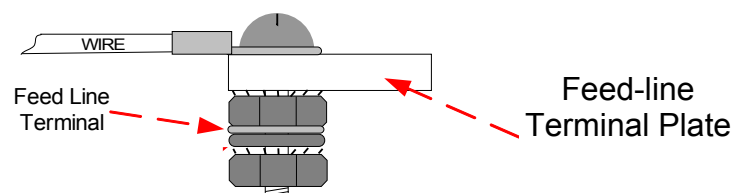
- Locate the Wire Spacers. Using 1 cable tie per wire, install one spacer on each side of the Driven Element at the center of the wire span, mid-way between the Spreader Assemblies.



- Install a cable tie on each side of the center wire cable tie as shown to ensure that the plate does not slide easily on the wire.

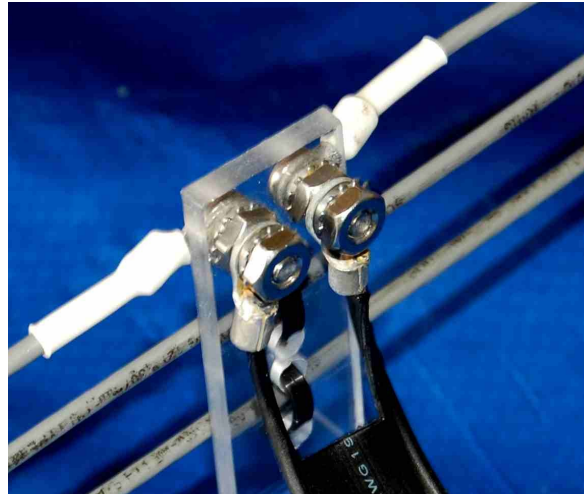


- The wires may sag on the Driven Element Support “X”. This is corrected by releasing the tube hose clamp slightly on each tube, one tube at a time, and extending the tube ¼” in length. Tighten the clamp and move to adjust the next tube. Repeat, extending each tube equally until the tubes begin to bow slightly. This slight bow places the wires under the correct tension.
- Do not become concerned if the wires sag slightly when the element is in the horizontal position. Sag will be eliminated when the element is positioned vertically.
- Ensure all 6 fasteners on the Element End Spacer are secure, then add and tighten a 10-24 SS Anti Vibration Nut over each of 6 Hex Nut w/tooth washer on the Element End Spacer.
- Attach your feed-line at the Feed-line Terminal Plate using the Ring Terminals and 12-24 Hex Nuts w/Tooth Washer provided. Secure the feed-line below the third wire with a cable tie placed around the feed-line and feed-line Terminal Plate. Bend the feed-line at a 90-degree angle near the cable tie. Then route the feed-line down to the Feed-line Support Tube. If using balanced feed-line, twist the feed-line one turn per foot before attaching the feed-line to the Feed-line Support Tube. Use 2 Black Nylon Cable Ties to attach the feed-line to the Feed-line Support Tube. Ensure that the 3 wires at the feed point plate are NOT twisted. Adjust the length of the feed-line to keep the wires parallel and in the same plane.



Driven Element & Feedline  
Connection – Side View





- ☐ You have completed assembly of the Driven Element. Temporarily place the Driven Element Assembly aside.

### **Director Element Assembly**

- ☐ Locate the remaining Director Element End Plate & Hub Assembly and, in similar fashion to the driven element, attach the 4 remaining Spreader Assembly Tubes to form the Director Element Support “X”. Refer to the assembly pictures for the Driven Element Support “X”. Note that the director End Plate & Hub Assembly does NOT include a Feed-line Support Tube. **The mounting hole provided is unused.**

**NOTE: The UNUSED Mounting hole is an indicator showing the top position of the Director Element. This side goes UP. When selecting the location to place the Element End Spacer, ensure it is placed at the BOTTOM of the Director Element.**

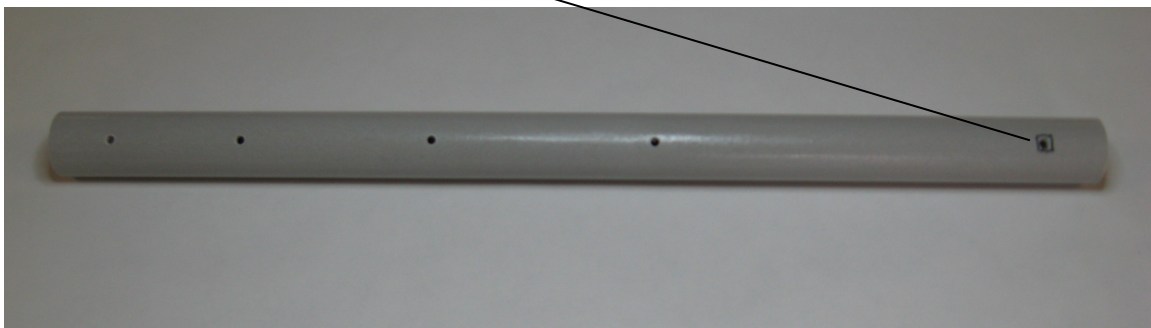
- ☐ Route the remaining three 2- Terminal Wire Assemblies in a similar fashion to the Driven Element. Note that a Feed-line Terminal Plate is not used. Route the wires around the Element Support “X” and attach the terminals at each end of the Element End Spacer. Fasten all wires with the black nylon cable ties.

- ☐ In a similar fashion to the driven element, attach each of the remaining 3 Wire Spacers in the center of each side and top wire span, mid-way between the Spreader Assemblies.
- ☐ Ensure all 6 fasteners on the Element End Spacer are secure, then add and tighten a 10-24 SS Anti Vibration Nut over each of 6 Hex Nut w/tooth washer on the Element End Spacer.
- ☐ This completes the Director Element Assembly. Temporarily move the assembly aside.

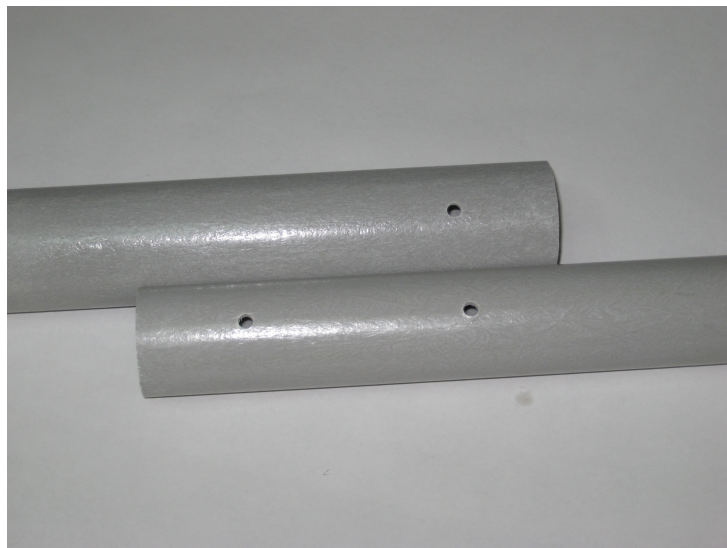
## **Boom Assembly**

- ☐ Locate the Boom Assembly with 2 Boom Extensions. Note: The LB-10M does NOT require Boom Extensions and are not included.
- ☐ For LB-20M through LB-12M antennas, insert the Boom Extensions into the central boom tube.

**Note: The marked hole indicates the outside end of each Boom Extension.**



- ☐ Insert each Boom Extension into the ends of the central boom tube. Align the hole of the central boom section and the extensions.



- ☐ Adjust the overall length of the boom by moving the Boom Extensions (equally) within the central boom tube. The length of the Boom required for your antenna is indicated in the chart below.

Antenna Model	Overall Boom Length (inches)
LB-20M	73.0"
LB-17M	64.4"
LB-15M	54.5"
LB-12M	46.0"
LB-10M	37.0"

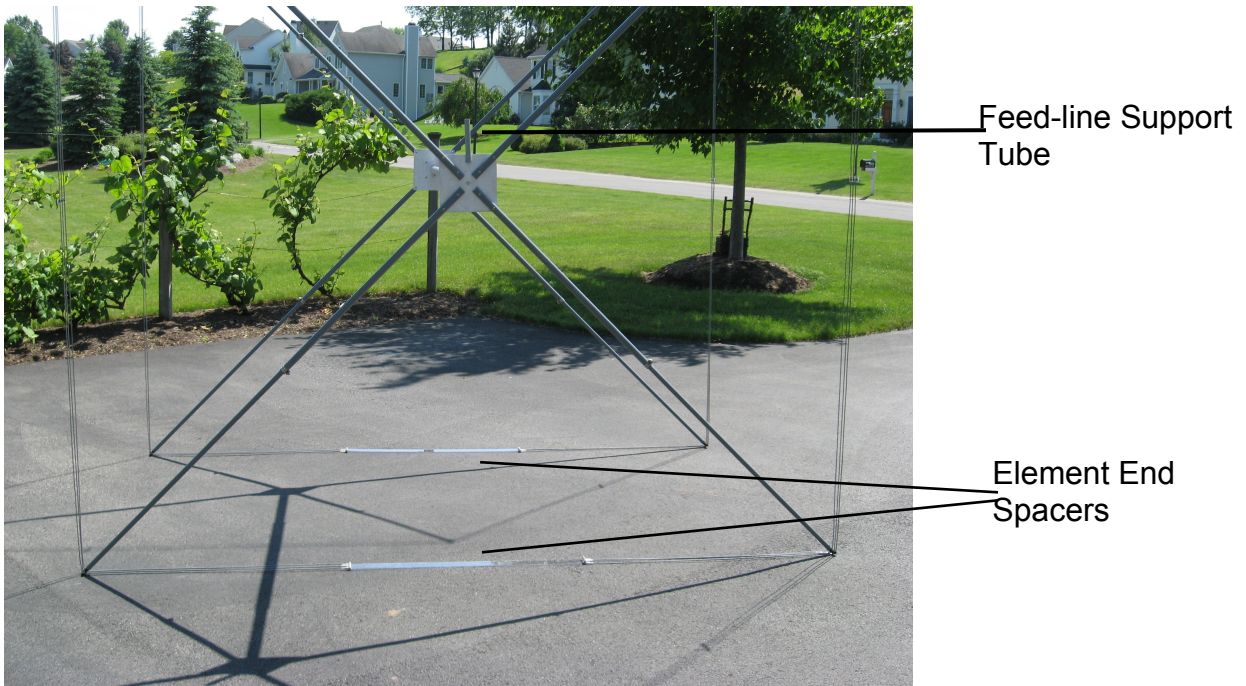
- ☐ Align the holes at the correct boom length position.
- ☐ Using two 10-24X2.0" SS Machine Screws and two 10-24 SS Anti-Vibration Nuts, fasten the Boom Extensions within the central boom tube.
- ☐ This completes the Boom Assembly.



## **Final Antenna Assembly**

- ☐ Locate the Driven Element Assembly and lay it flat on a flat ground-level surface with the Hub of the End Plate & Hub Assembly in the UP position.
- ☐ Place one end of the Boom Assembly over the Hub and fasten using one 10-24X1.5" SS Machine Screw and one 10-24 SS Anti-Vibration Nut.
- ☐ Lift the Director Element Assembly and turn the Assembly to position the Hub of the End Plate & Hub Assembly in a DOWN position.

**Note: Position the Director Assembly over the Driven Element Assembly and ensure that the Element End Spacer of each element is located on the same side of the Antenna Assembly.**



- ☐ Insert the Director Element Hub into the Boom Assembly and fasten using one 10-24X1.5" SS Machine Screw and one 10-24 SS Anti-Vibration Nut.
- ☐ Lift the completed Antenna Assembly and rotate the Boom Assembly to a horizontal position.

- ☐ You have completed the Antenna Assembly



**Fully Assembled LB-20M Antenna  
Without Feed-line**  
9.4 feet per side.  
Remarkably Small

**NOTE:**  
For feed-line options, please refer to the following document.

**“Light Beam Antenna Feed-line Options”**