

NA4RR Hexagonal Beam Antenna

Assembly Instructions

It is helpful if you completely read through the instructions a couple of time before you start.

Suggested Tools Needed

- Medium screwdriver for spreaders clamps or ¼” nut driver
- Pliers for closing S hooks on Support cords
- 7/16 wrench or nut driver for attaching center post and element connections

Components

1. Base plate.
 - a. Made of 3/16 aluminum Plate.
 - b. Aluminum Custom size center tube mates up perfectly to either a 1” or 1.5” mast.
 - i. A 1 inch (1 1/4od) water pipe or mast will fit into the bottom tube.
 - ii. A 1 ½ EMT conduit will fit over the tube
 - c. Six 4 inch pieces of 1.25 inch round tubing.
2. All metal, coaxial aluminum center post requires no wiring harness. An SO 239 UHF coax chassis connector is on back of the post at the top.
3. Six fiberglass spreader arms of three telescoping sections, each equipped with guy rings for the antenna wire sets for each band.
4. Wire assemblies for each band. Wire set pre-measured and assembled.
5. Eight /Dacron covered support cords.
 - a. 6 Cords go from center post to end of spreader arm.
 - b. 1 Cord goes between spreader 1 and 6 at the tip.
 - c. 1 Cord goes between spreader 1 and 6 near the 15m rings.

Painting:

For UV protection the spreaders can be painted with any non-metallic paint.

This is one way from Allen Bond at MaxGain <http://www.mgs4u.com/fiberglass-tips.htm> “Any fiberglass, no matter how UV-stabilized, will eventually degrade after prolonged exposure to sunlight. Make your spreaders last many years longer-and decrease their visibility. First clean/degrease them with a good solvent such as acetone or methyl ethyl ketone... "M.E.K." (follow their label directions!) Then use a good primer-allowing it to cure at least two days. Finally, finish with a good top coat of flat black. This paint treatment is suitable for most any fixed-position use of fiberglass tube or solid rod which will not require sleeving movement between sizes.” Do Not sand the spreaders.

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After you have read through all the instructions, start by laying out the parts so you can get to them.



Temporary Test Stand:

Arrange a temporary stand for assembling of the beam. A large 5 gallon bucket turned right side up, with sand will work or a one inch pipe stuck in the ground. You want the spreaders to be fairly level as you install the wire assemblies.

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1. Place the baseplate onto your mast with the 6 tubes facing up.
2. Drill into your mast to match the holes in the tube. Insert a cross bolt (a ¼" X 2" stainless steel bolt and nut are included in hardware pack for this purpose) to insure the holes line up well. This is best done by drilling the hole after the antenna is set onto the mast.
3. Place the base plate into the temporary stand.



4. Insert the center post into the base plate and turn it so that the SO-239 coax connector is on the same side as the large hole in the base plate. This is the rear of the beam. The direction of the main beam lobe is in the opposite direction. The coax will connect on the back of the center post and can come down through the hole in the back of the base plate. You do **not have** to route the coax through the hole. A UV mil grade grommet is provided for the hole. The grommet is slit so that you can remove it, place it around the coax and then put it back in the hole.



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5. Secure the center post to the base plate using (a ¼" X 2" stainless steel bolt and nut are included in hardware pack for this purpose).
6. Insert the six large spreader sections (1 inch) into the round tubes on the base Plate. There is a stop at the back of the tubes to limit the spreader from going to far. All the spreaders are identical. There is a mark on the spreader near the end that goes into the tubes. (4" from end.) **Make sure the rings are on the upper side of the spreaders.**
7. Insert the medium (¾") spreaders into the large spreaders. On each of the medium spreaders there is a stop clamp 4" from one end. Insert each of the six medium spreader sections (¾ inch) into the end of a larger. Spreader and push it up to the stop on the medium spreader. **Make sure the rings are on the upper side of the spreaders.**
8. Insert the small (½") spreaders into the Medium spreaders. On each of the medium spreaders there is a stop clamp 4" from one end. Insert each of the six small spreader sections into the end of the medium spreader and push up to the stop. **Make sure the rings are on the upper side of the spreaders.**

Note: The spreader sections will be kept together by the tension of the support cords and can be easily taken apart for portability. However, if you wish, you can attach them permanently by using some general purpose adhesive such as Liquid Nails. But this is not necessary for the beam to hold together. Once the adhesive has set it will be next to impossible to ever again get the spreaders apart.

9. Hook one end of a long support cord to the end of a spreader and pull it toward the center post. For now temporarily hook it on the ring closest to the center post.



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- Hook another long support cord to the end of the opposite spreader from the above step. Now grip the loose ends of both cords and pull them together until you can hook both over the eye bolt on the top of the center post at the same time. The pulling of two spreaders at the same time is to avoid unnecessary stress on the center post.



- Repeat this until all six spreaders and support cords are attached to the center post.

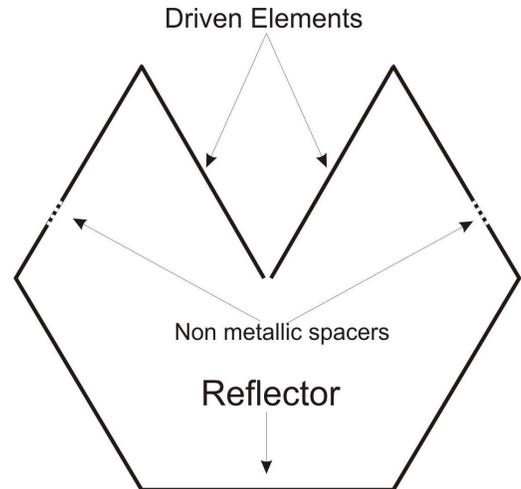


- With the needle nose pliers close the S hooks that are on the center post.
- Connect the remaining long support cord between the ends of spreaders 1 and 6. The shorter one will be attached in a later step after the wires have been installed. These two support cords help keep the distance between spreaders 1 and 6 as there is no wire going between them like on the other spreaders and without these spreader arms 1 and 6 will be pulled too far apart. When you first install this cord it is usually slack but that is normal.
- Secure the S-hooks at the end of the spreader arms with the included hose clamps.

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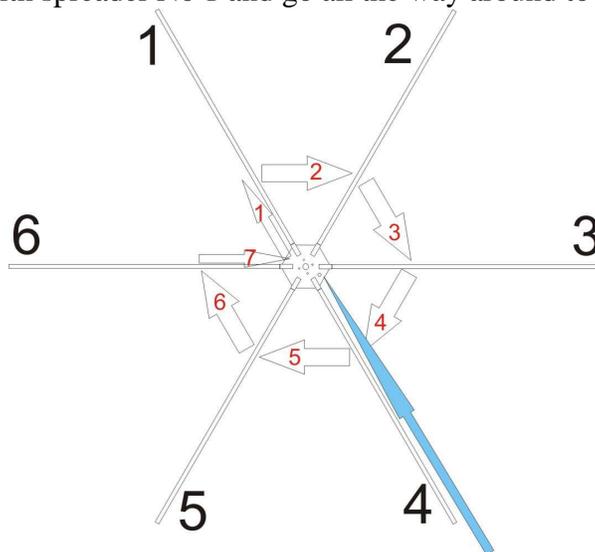
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Note: At this point the spreaders are still like wet noodles but will take more shape after all the wires are on.



DO NOT over tighten the wires. The wires should be a little slack. But you might need to pull a little to get the lugs onto the screws.

15. Locate the 6M wire. Lay it out on the ground full length, in a line, and get out any twists.
16. Attach one end of the 6M wire to one of the bottom stud on the center post.
17. Start threading with spreader No 1 and go all the way around to No 6.



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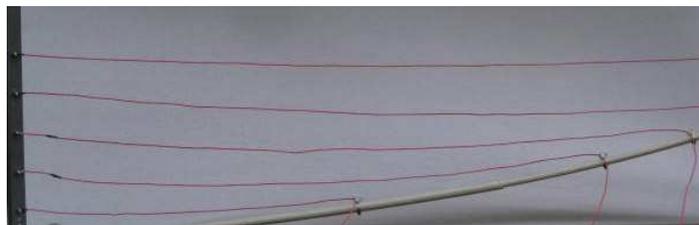
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18. When the wire assembly is pulled through the rings around all six spreaders connect the ring terminal to the corresponding stud on the center post. Make them snug **but do not over tighten and allow the bolt to twist**. If there is not enough slack to do this easily, start with the side that is attached to the center post and gently pull the slack toward the end that is not connected. If this does not allow enough slack slightly loosen the clamps on spreaders 1 and 6 and let them slide in toward the center post so you can make the connections.



DO NOT LOOSEN the hex nuts that are already on the center post.

19. Repeat steps 15 - 18 with the wire assemblies for 10,12,15,17 and 20 meters are installed. **Do not try to get the tension on the wires right until all of the wires have been installed.**
20. Now install the remaining small support cord to spreaders 1 and 6 to pull them back into shape. This cord should be located at about the 15 M wire but put it where it seems to do the most good in pulling the spreaders back straight.
21. Re-adjust any clamps on spreaders 1 and 6 that you may have had to loosen. Do not over tighten the wires, however, you do not want them too loose as they get too close the wires of the next band. This is also not good and will cause the SWR of those two to not be right. **You want to keep the spacing between wires.**
22. Examine the wire sets to see if any are too taut or loose. You can tell if wires are too taut by whether the SUPPORT cords are sagging. If they are sagging, then you have a wire too taut. The support cords are suppose to handle the tension created by the bent spreaders. On the other hand if the wires are drooping you can take up slack by moving all the clamps outward equally for that wire. If you need to move any clamps for a band, move them all by small amounts(1/4 inch), until you are satisfied.



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23. Conduct a continuity test from the center of the SO 239 to the bottom INSULATED terminal. You should have zero DC resistance. Also check across the center of the connector to the outside of the connector to make sure there is no short anywhere.
24. After you are sure there are no shorts connect your feed line from your balun and **then seal the coax connections to keep moisture out**. Now is a good time to look things over. If you stand back and look down the spreaders they should be fairly straight. The coating on the wire will sometimes want to grab onto the rings. If the spreaders still don't seem to line up "help" the wire by moving a little through the rings until everything is as symmetrical as you can get it. It doesn't have to be perfect. If you do nothing eventually with a little bouncing around in the wind everything will line up.
25. Place antenna onto your mast.
26. Secure the antenna to the mast with a bolt.

Your antenna assembly is now complete. It's time to start talking some DX

This antenna is designed to operate on the Amateur Radio Ham Bands of 6m,10m,12m,15m,17m and 20m. It is not designed to operate on 30m or 40m or outside the amateur bands. DO NOT transmit, even with the aid of a tuner, outside the designed bands. This can cause excessive voltage and arching of the terminals on the center post and replacement is not covered by any warranty.

This is what Steve Hunt G3TKQ has to say about trying to use the antenna on 40m

"Depending on the length of your coax and the type of feed point choke you have installed, one or more of the following will occur:

- * Significant differential-mode power losses in the coax
- * CM current will be driven onto the coax braid and it will function as a vertical antenna
- * CM current will be forced through the feedpoint choke and it will overheat and/or shatter.

73,
Steve G3TXQ

BALUN

Get the most from your antenna. The antenna will work best if you place a 1:1 choke balun at the feed point to deal with the common-mode current issues. SEE http://www.karinya.net/g3txq/hexbeam/common_mode/

We now stock a BA-8 balun

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