

815HD Compact Tower – Assembly and Installation – updated Sept 15, 2026

Please carefully follow the steps outlined below to properly assemble and install your heavy duty, roof mount tower. It is important to know that there are flat washers and nylon locking nuts for each bolt. The tower is designed to have the bolts start with a flat washer added and then enter from the outside and connect to the nuts on the inside. The only exception is the foot mounting. The flat washer is located in-between the leg and the foot. Note that the metals are “laser cut” and may have sharp edges so wear appropriate gloves then handling the metal. Where the cross braces and shelves bolt to the legs, you may need to feed the bolt in partially as you screw the nut on, as the area is congested. There are 3 types of bolts in this design: 5/16”-18 x .750”, 5/16”-18 x 1.00”, and 3/8”-16 x 1.00” (used to connect the feet), So the question of where to use the 1 inch and .750” long bolts? Here is the rule; if you are connecting 2 layers of aluminum – use .750 long bolts and if 3 sheets of aluminum – use 1.0” long bolts.

A second thing that is even more important to know is to NOT use a power driver to assemble the bolts and nuts. The hardware is stainless steel and in my experience is if you turn the bolt fast with a drill / nut driver, they tend to gall. When this happens the bolt and nut become inseparable and must be cut off with a disk grinder. Note that we include a anti-seize compound. Please use the nickel anti-seize on the threaded portions of the stainless-steel bolts.

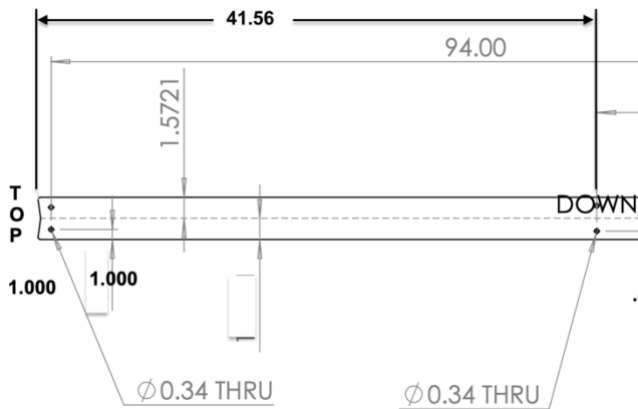
1. Remove all items from the packages and compare them to the parts list at the end of this document to make sure all parts are present and identified.
2. Begin by assembling the 4 top angle brackets to the bottom of the GS-065 thrust bearing, using the 4 bolts and lock-washers supplied with the mast bearing. Note these are 8mm metric. Save the other parts in the bearing box to use when you connect the mast. Tighten all bolts securely, leaving equally spaced gaps at each corner. Notice how the sides of the collar pieces have an 8-degree draft angle built into the fabrication. This makes assembly easy and precise.



Figure 1



Figure 2



3. Determine which end of the legs are the top. The location of the first hole relative to the top is shown in the Figure 3. Mark the top of legs for reference.

Figure 3. Assemble two legs and a top shelf collar bracket, together as shown in Figure 4.



NOTE: Because of a space constraint, The top collar section uses (8) 3/4" long 5/16 " bolts. Place the lock-nuts just slightly loose on these bolts.

5. Continue to assemble the bottom and top shelf bracket and 2 cross braces and 2 V braces together with the 5/16"-18 x 1" bolts, flat washers and lock-nuts as shown in Figure 4.

Figure 4



6. Continue to assemble the bottom and top shelf bracket and 2 cross braces on the *next face* together with 5/16"-18 x 1" bolts, flat washers and lock-nuts as shown in Figure 5.

Figure 5

that the collar uses the shorter 5/16"-18 x 3/4" bolts. Place the lock-nuts just slightly loose on these bolts.



Figure 6



8. Rotate the assembly and add an upper and lower shelf assembly to the left side as shown in Figure 7. Now you have 3 sides complete. Place the lock-nuts Just slightly loose on these bolts.

Figure 7



Figure 8

9. Add the upper and lower shelves along with cross braces to the last face as shown in Figure 8. Now you have all of the sides complete.



Figure 9



Figure 10

9. Now it's time to attach the 2 rotor shelves to 2 of the lower shelf brackets with 4 each 5/16"-18 x 1" bolts and locknuts as shown above in Figure 10.

Because these brackets have multiple holes in them to support both the Yaesu and the Hy-Gain type of rotators you will need to verify that the rotor mounting holes are 3.31" (Yaesu or 3.00" (Hy-Gain) spaced, and then lightly snug these bolts.



Figure 11

10. Attach a foot on each leg with 3/8"-16 x 1" bolts, locknuts as shown below. Hand-tighten the hardware at this time.



Figure 12

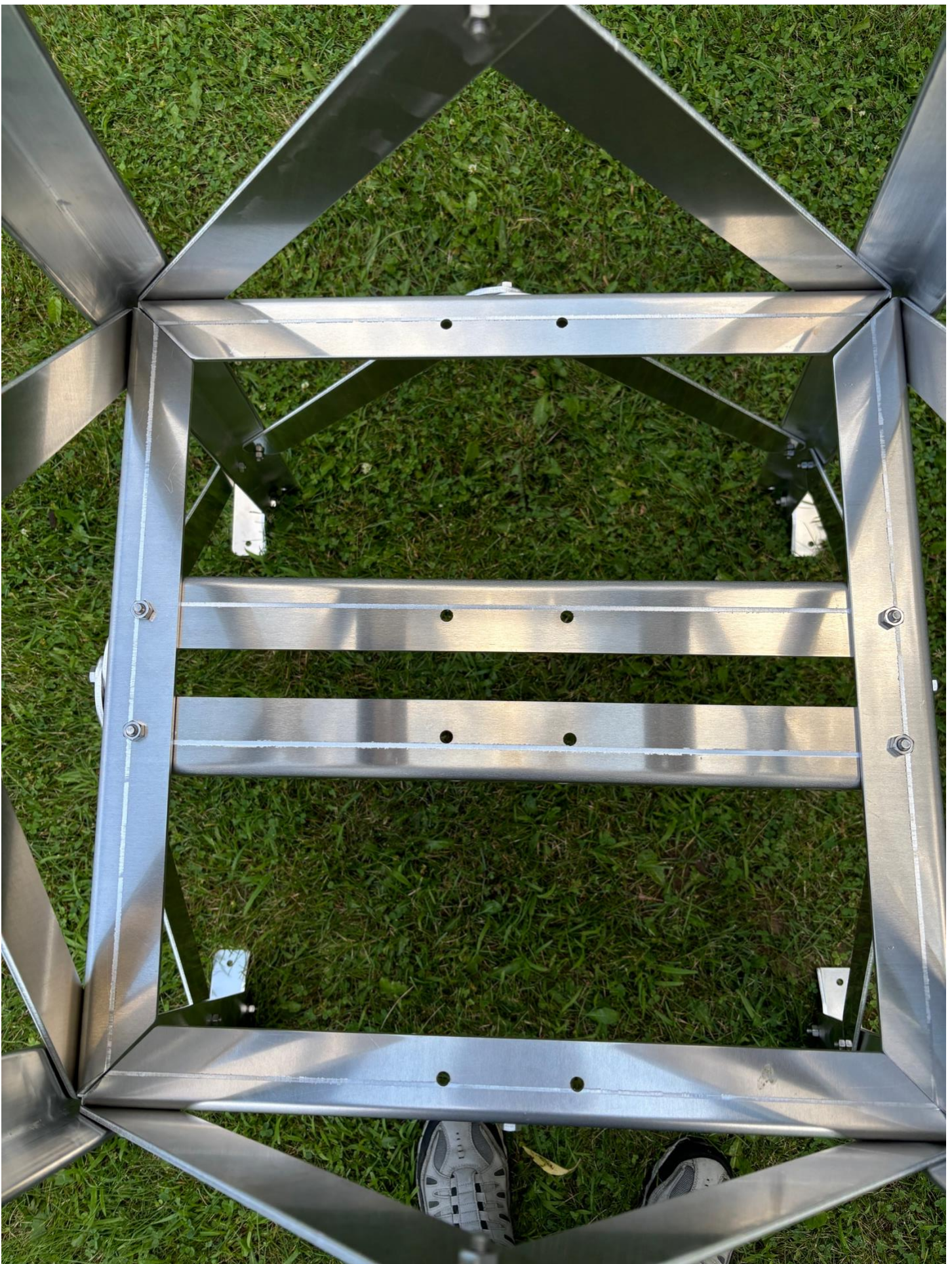
11. Install the rotor and mast to make sure everything fits and aligns with the thrust bearing. You can decide at this time if you wish to secure the rotor onto the rotor shelf before or after placing the tower on the roof.



Figure 13

12. Once the tower is setting up on level ground you can finish tightening the bolts up making sure that all of the pieces are coming together flush and it feels sturdy.



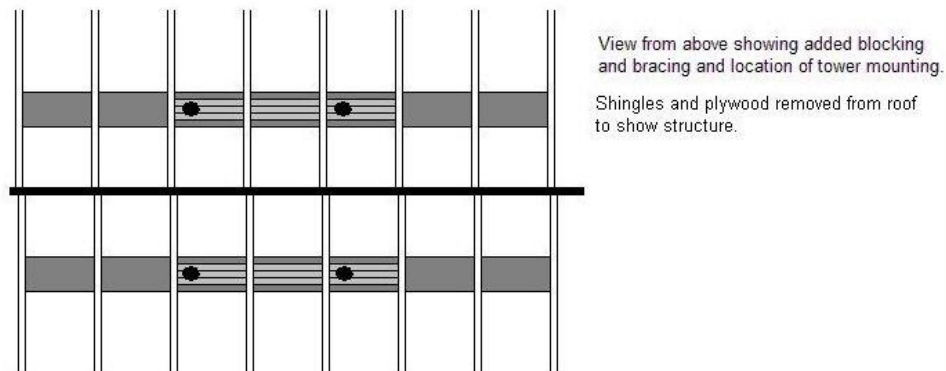
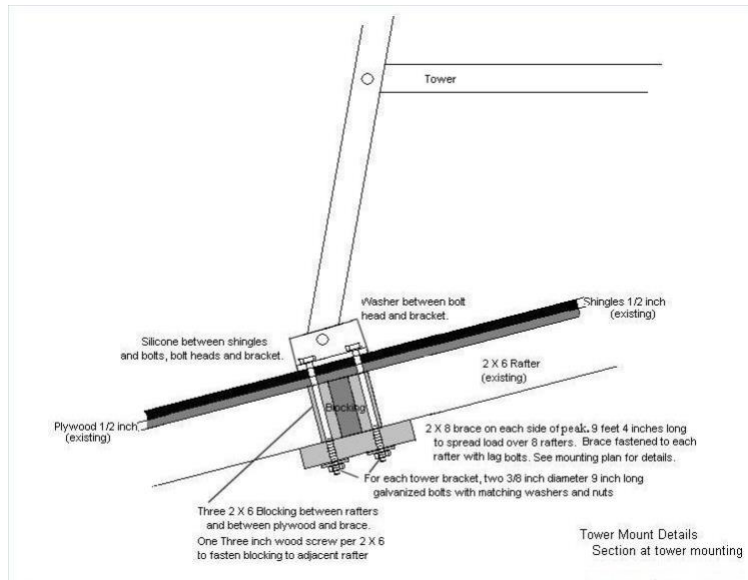




The finished 815HD Roof Tower Assembly.

Roof Mounting Information

You will need to determine how you wish to attach the tower to your roof. In an illustration below you can view recommended mounting procedures for a sloped roof with asphalt shingles. Other mounting methods may be used depending on your particular roof. The feet mounting holes are drilled to accept 3/8" bolts. Stainless steel or galvanized 3/8"-16 x 10 to 12 inch long all-thread are recommended. For older roofs you may need to spread the over 8 rafters (4 on each side).



Key of roof and bracing components

-  Rafter - 16 inch centers but not perfectly aligned across the ridge rafter
-  Ridge Rafter at peak of roof
-  Added Blocking between rafters under tower
-  Added brace to spread load between rafters
2 X 8 by 9 feet 4 inches long
-  Mounting points for tower
(32 inches between legs - 8 foot tower)
(27 inches between legs - 6 foot tower)
(24 inches between legs - 4 foot tower)

One 1/4 inch lag bolt fastens the brace to every rafter. Lag bolt length is 5 inches and is in the center of the brace. Washer is under the head of the bolt.

Tower mounting details
Mounting plan

Please use the link: <https://carlsontowers.com/helpful-resources/> to download the latest installation manual.
If you have a discrepancy in the parts list please contact sales@carlsontowers.com.

IO-815HD Parts List (per tower)

☐ Top collar bracket (2" x 1.2" x 5" x 3/16")	4	☐ Lower shelf (mitered) (2" x 2" x 22½" x 3/16")	4
☐ Cross braces (2" x 30" x 3/16")	8	☐ Lower rotor support – (2" x 2" x 22 x 3/16")	2
☐ Tower foot – (2" x 2" x 6" x 3/16")	4	☐ Upper shelf (mitered) (2" x 2" x 16" x 3/16")	4
☐ V braces (2" x 24" x 3/16")	8	☐ GS-065 with hardware (optional)	1
☐ Hardware for collar and other 2 layers alum:		5/16"-18 x 3/4" SS bolt	24
5/16" flat-washer SS	24	5/16" nylon lock-nut SS	24
☐ Hardware for 3 layers alum:		5/16" "-18 x 1.0" SS bolt	20
5/16" nylon lock-nut SS	20	5/16" flat-washer SS	20
☐ Hardware for feet			
3/8"-16 x 1.0" SS bolt	4	3/8"-16 nylon lock-nut SS	4
3/8 flat washer SS	4		

Weights:

Hardware package with 24 count bolts:	765 g,	Hardware with 36 count bolts:	1008 g,
IO-045HD parts: with Mast Bearing:	20.1 lbs	IO-045HD parts: without Mast Bearing:	16.6 lbs
IO-610HD parts: with Mast Bearing:	22.9 lbs	IO-610HD parts: without Mast Bearing:	19.8 lbs
IO-810HD parts: with Mast Bearing:	28.7 lbs	IO-810HD parts: without Mast Bearing:	25.4 lbs
IO-815HD parts: with Mast Bearing:	36.8 lbs	IO-815HD parts: without Mast Bearing:	33.4 lbs

☐ Tower Legs (2" x 2" x 50" x 3/16")	4	14.0 lbs
☐ Tower Legs (2" x 2" x 74" x 3/16")	4	20.4 lbs
☐ Tower Legs (2" x 2" x 95" x 3/16")	4	26.8 lbs
☐ Mast-95 (1.5" sch 40 alum pipe (1.60" x 1.90" x .150 "wall x 95"))	4	7.4 lbs
☐ Mast-72 (1.5" sch 40 alum pipe (1.60" x 1.90" x .150 "wall x 72"))	4	5.6 lbs
☐ Mast-60(1.5" sch 40 alum pipe (1.60" x 1.90" x .150 "wall x 60"))	4	4.7 lbs
☐ Mast-48 (1.5" sch 40 alum pipe (1.60" x 1.90" x .150 "wall x 48"))	4	3.8 lbs
☐ Mast Clamp	1	1.0 lbs
☐ Upper Shelf Option for 045	1	3.7 lbs
☐ Fully Threaded Rod 3/8-16 x 12"	8	2.0 lbs

Customer Name: _____ Date: _____ Inspector: _____

Specifications	IO-815HD
Tower Height	7.92 feet (95 inches)
Base Width	32 inches
Tower Weight	70 lbs.
Max. Antenna Wind Area at tower top	15 sq. ft. at 80 mph, 90% within 1 ft of tower
Max. Antenna + Rotor + Mast Weight	250 lbs.
Tower Top Width	5 inches
Rotor Plate location from Top	64.5 inches
Rotor Mounting Options	Hy-Gain or Yaesu
Thrust Bearing (recommended, +\$79)	Yaesu GS-065
Maximum Mast Diameter	2.5 inches
Mast (recommended, not included)	2" or 2.5" OD x 10 foot galvanized steel
Leg material	6061-T6 aluminum (3/16" thick x 2" angle)
Shelf Material	6061-T6 aluminum (3/16" thick x 2" angle)
Rotor Shelf Material	6061-T6 aluminum (1/4" thick x 2" angle)
Foot material	6061-T6 aluminum (1/4" thick x 2" angle)
X-Brace and V-Brace material	5052-H32 aluminum (3/16" x 2" flat)
Assembly Hardware	5/16"-18 18-8 stainless steel
Foot to Leg hardware	3/8"-16 18-8 stainless steel
Nylon Locknuts coat with Nickel Anti-Seize	Yes
Climbable	Yes – with tower climbing belt or harness