

45HD 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 .75 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. See Page 10 and 11.
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 (used for guy wires) 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 hole relative to the top is shown in the Figure 3. Mark the top.

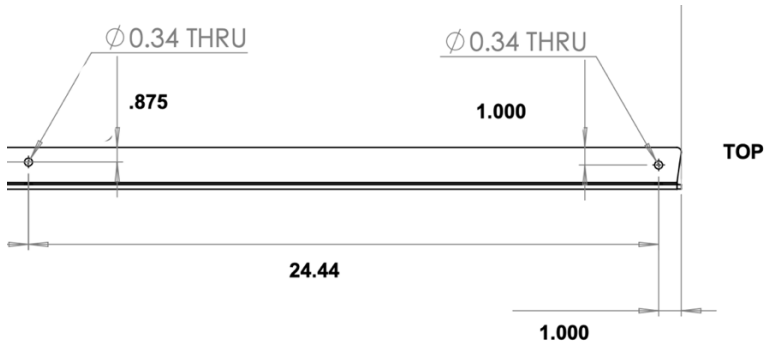


Figure 3



4. Assemble two legs and a top shelf collar bracket. Note that the top of the leg is marked top and will be connecting to the outside of the top shelf bracket.

Figure 4



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

Figure 5



5. Now as in Figure 6, add in the right side of the tower's bottom shelf bracket and cross braces. One temporary 5/16"-18 x 1" bolt is holding the cross brace and shelf in place.

Figure 6



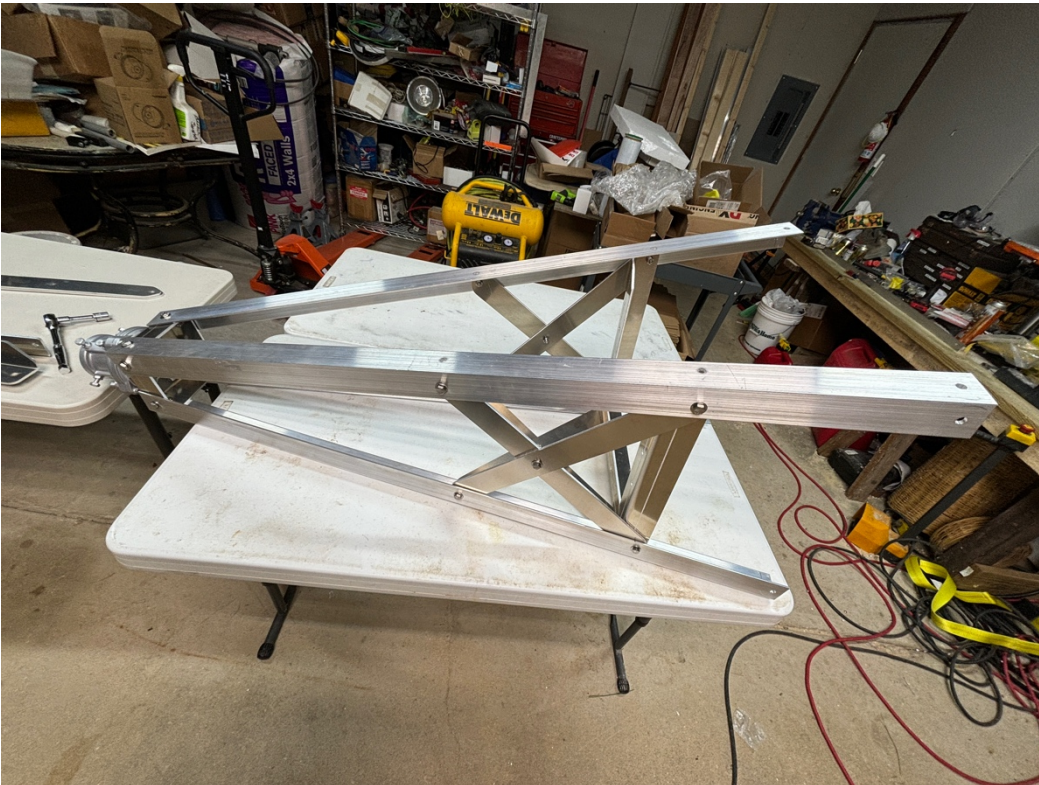
6. Attach a leg to the collar bracket, cross brace and shelf assembly as shown below in Figure 7 using the 5/16-18 bolts, flat washers and lock-nuts. Loosely-tighten the fasteners at this time.

Figure 7



Figure 8

7. Repeat this same process to assemble the fourth leg assembly complete with the shelves and cross braces, identical to the one assembled in Step 6. See Figure 8.



8. Assemble the cross braces, and shelf bracket using 5/16"-18 x 1" bolts and locknuts.

Figure 9

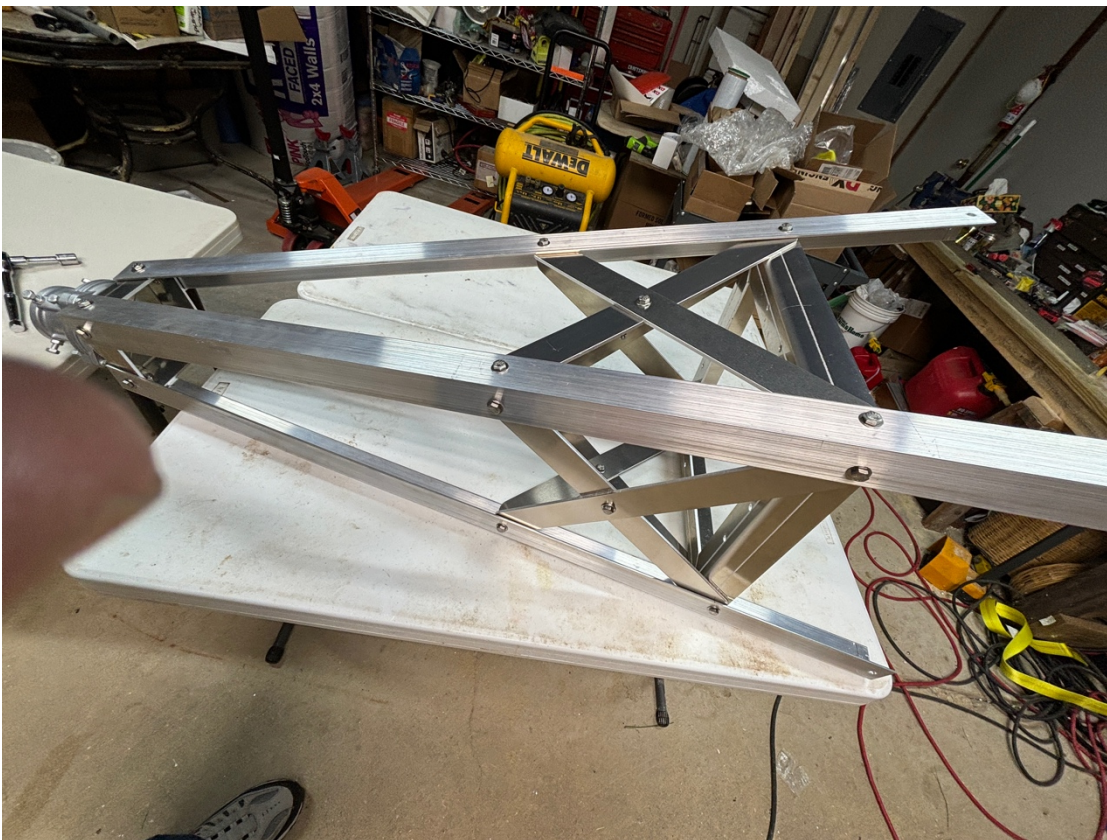
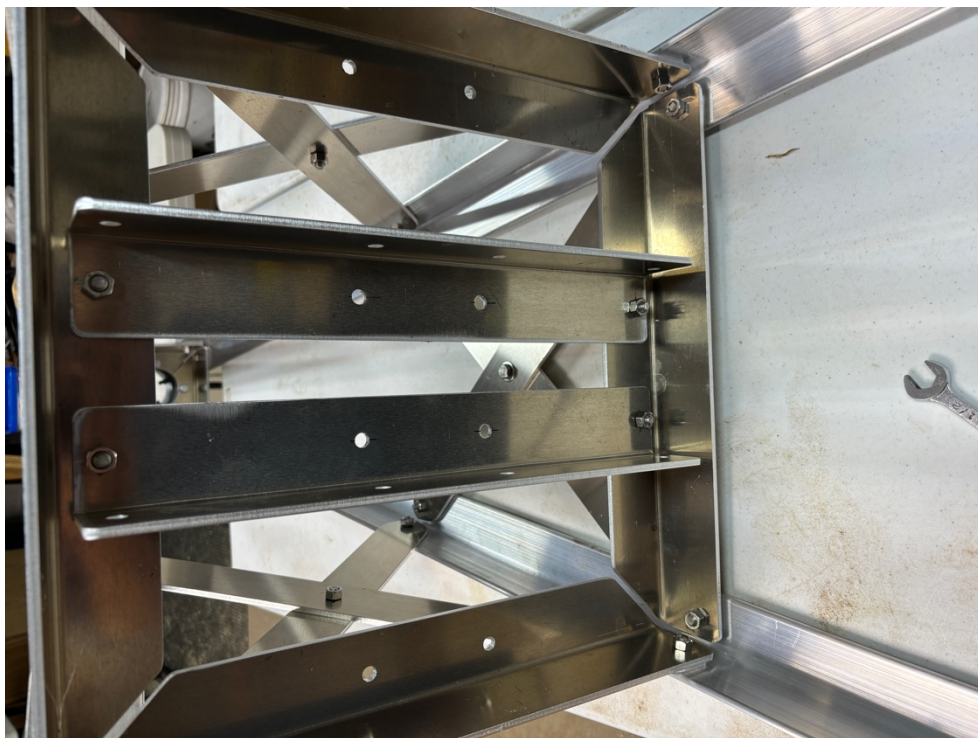
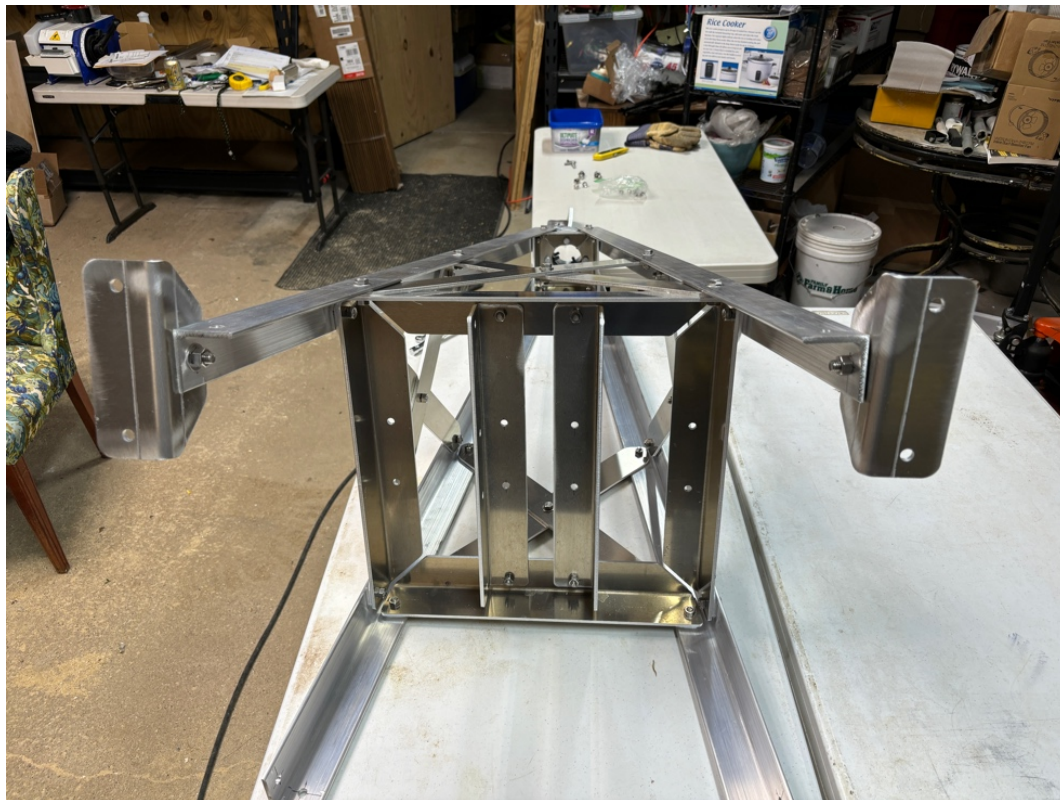


Figure 10



9. Attach the 2 rotator shelves to 2 of the lower shelves with (4) 5/16"-18 x 1" bolts and locknuts as shown above in Figure 6. The rotator shelves offer two hole spacings to accommodate the Yaesu (3.31") or Hy-Gain (3.00") rotators.

Figure 11



10. Attach a foot on each leg with 3/8"-16 x 1" bolts, locknuts as shown below with the flat washer in between the leg and foot.

11. Install the rotator 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 12

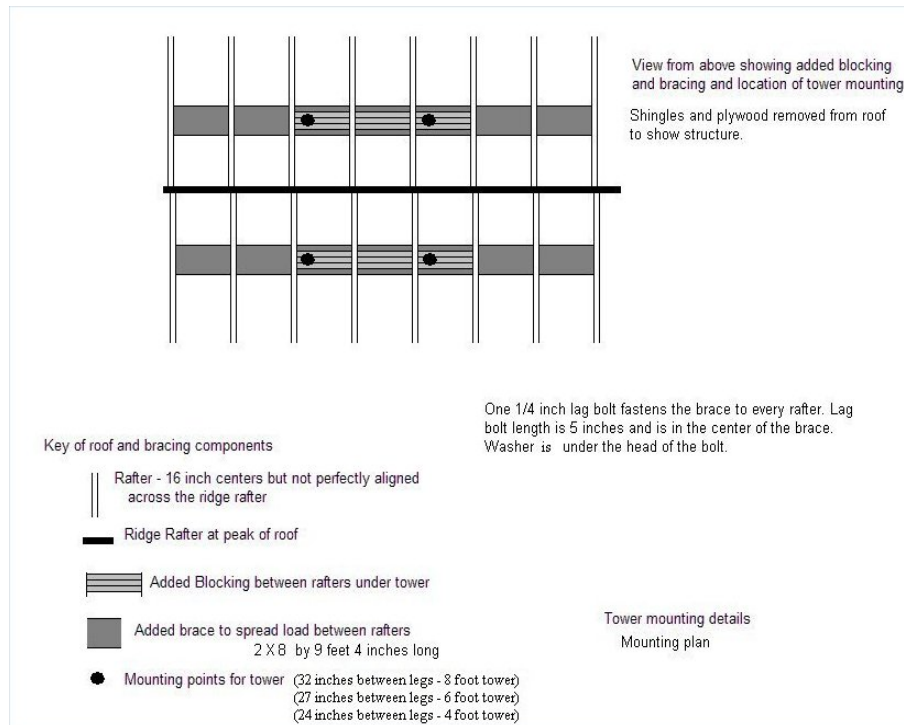
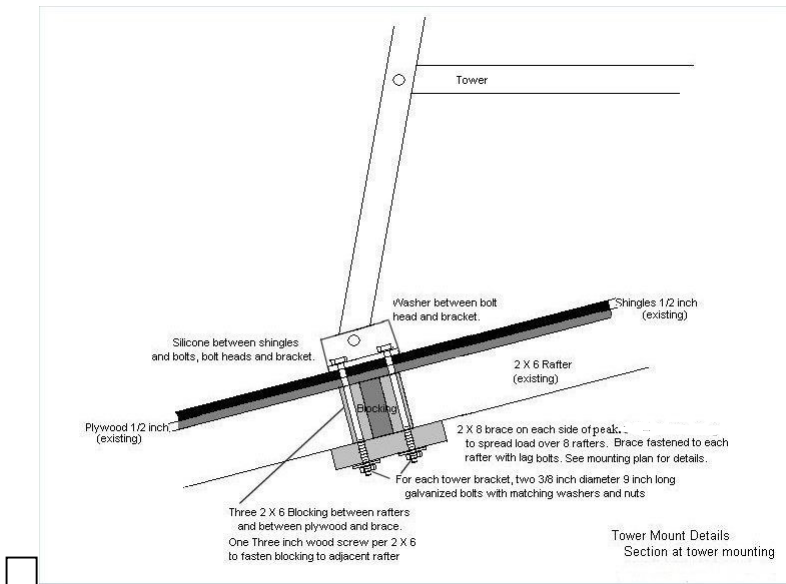
12. Once the tower fully assembled you can finish tightening the bolts up making sure that all of the pieces are coming together flush and it feels sturdy.



The finished 45HD Roof Tower Assembly

45HD ROOF MOUNTING GUIDELINES

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 zinc plated 3/8"-16 x 12 inch long all-thread, with nylon locking nuts and flat washers are usually used as its difficult to find long bolts of the correct length. . Mastic "Pitch pads" are recommended for sealing the holes between the feet and around the shingles.



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

IO-45HD 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
☐ Short cross braces (2" x 20" x 3/16")	8	☐ Lower rotor support – (2" x 2" x 15" x 3/16")	2
☐ Tower foot – (2" x 2" x 6" x 3/16")	4	☐ GS-065 with hardware (optional)	1

☐ Hardware for collar and other 2 layers alum:	5/16"-18 x 3/4" SS bolt	24
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5/16" flat-washer SS	24	5/16" nylon lock-nut SS	24
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☐ Hardware for 3 layers alum:	5/16" "-18 x 1.0" SS bolt	8
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5/16" nylon lock-nut SS	8	5/16" flat-washer SS	8
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☐ Hardware for feet		3/8"-16 x 1.0" SS bolt	4
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3/8"-16 nylon lock-nut SS	4	3/8 flat washer SS	4
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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

Customer Name: _____ Date: _____ Inspector: _____

Specifications	IO-45HD
Tower Height	4.17 feet (50 inches)
Shipping Weight	36 lbs.
Base Width (to outer edge of leg)	22 inches
Base Width (to outer edge of foot)	26 inches
Max. Antenna Wind Area at tower top	13 sq. ft. at 80 mph
Max. Antenna + Rotor + Mast weight	200 lbs.
Tower Top Width	5 inches
Rotor Plate location from Top	38 inches
Maximum Mast Outside Diameter	2.5 inches
Maximum Mast Length	7 feet (84 inches)
Rotor Mounting Options	Hy-Gain or Yaesu
Thrust Bearing Mounting Options	Yaesu GS-065
Leg and material	6061-T6 aluminum (3/16" thick x 2" flat)
Foot material	5052-H32 aluminum (3/16" thick x 2" angle)
Rotor Shelf material	5052-H32 aluminum (3/16" thick x 2" angle)
X-Brace material	6061-T6 aluminum (3/16" x 2" flat)
Assembly Hardware	5/16"-18 18-8 stainless steel (32)
Foot to Leg hardware	3/8"-16 18-8 stainless steel (4)
Nylon locknuts – coat with Nickle Anti-Seize	Yes
Climbable	Yes – with tower climbing belt or harness