

SELF-SUPPORTING TILT-OVER TOWERS

LM SERIES INSTALLATION



Beacon Pole, LLC

1-800-842-7622

www.b-pole.com

Safety First

- *Please read through the instructions before beginning this project.*
- *We recommend a licensed, well qualified contractor or Internet Service Provider be employed to install the tower/mast, however, It is laid out here for a Do It Yourself Installation, which is the most economical option.*
- *Installers must wear appropriate personal protective Safety Gear Including:*
 - *Steel Toed Shoes*
 - *Safety Glasses*
 - *Work Gloves*
 - *Hard Hat*
- *Always consider that any tower/mast may fail in extreme circumstances. Never place any tower/mast where it could fall and strike power lines or buildings.*
- *Do Your Homework.*
 - *Get underground utilities marked before installation.*
 - *Mark pipes and electric cables before drilling or trenching.*
 - *Keep tower/masts away from power lines, height +15 feet.*
- *Bury and cement the ground pole to the minimum specified depth using concrete.*
- *Ground the radio/antenna using a separate copper conductor and ground rod to local code.*
- *Install lightning/power surge protection in Ethernet cable at base of pole and where it enters a building.*
- *Do not overload the tower/mast with multiple or oversized antennas, lighting or cameras.*
- *Keep Alert.*
 - *Installation of any tower/mast should not be attempted in windy conditions. Don't raise or lower tower/mast in more than a gentle breeze.*
 - *Always stand and work to the sides of the Cheek Plates.*
 - *No one should stand under or in the path of the tower/mast while it is being assembled, raised, or lowered.*
 - *Inspect all tools, winch & accessories, straps, and ladder for wear or damage.*

A Few Words About Wind....

Beaufort Number	Wind Speed (miles/hour)	Wind Speed (km/hour)	Wind Speed (knots)	Description	Wind Effects on Land
0	< 1	< 1	< 1	Calm	Calm. Smoke rises vertically.
1	1-3	1-5	1-3	Light Air	Wind motion visible in smoke.
2	4-7	6-11	4-6	Light Breeze	Wind felt on exposed skin. Leaves rustle.
3	8-12	12-19	7-12	Gentle Breeze	Leaves and smaller twigs in constant motion.
4	13-18	20-28	11-16	Moderate Breeze	Dust and loose paper are raised. Small branches begin to move.
5	19-24	29-38	17-21	Fresh Breeze	Small trees begin to sway.
6	25-31	39-49	22-27	Strong Breeze	Large branches are in motion. Whistling is heard in overhead wires. Umbrella use is difficult.
7	32-38	50-61	28-33	Near Gale	Whole trees in motion. Some difficulty experienced walking into the wind.
8	39-46	62-74	34-40	Gale	Twigs and small branches break from trees. Cars veer on road.
9	47-54	75-88	41-47	Strong Gale	Larger branches break from trees. Light structural damage.
10	55-63	89-102	48-55	Storm	Trees broken and uprooted. Considerable structural damage.
11	64-72	103-117	56-63	Violent Storm	Widespread damage to structures and vegetation.
12	> 73	> 117	> 64	Hurricane	Considerable and widespread damage to structures and vegetation. Violence.

- The LM Series Self Supporting Towers are designed for wind loads up to 75 mph Fastest Mile and 95 mph 3 Second Gusts. However, never raise or lower a mast if the wind speed is greater than 8 mph. It would be better to leave it up than to try to lower it at that time.
- Wind force varies as the square of wind speed.
- The force on an object at 4 mph is 4 times greater than the force at 2 mph.
- The force on an object at 8 mph is 16 TIMES GREATER than the force at 2 mph.
- The Ventusky App is good for wind speed, gusts, and forecasts.
- Wind is often calmest in the early morning.

TOWER KITS

- A—Base Square Section
- B—2nd Section (Attached to Base)
- C—3rd Section (Tucked Inside 2nd Section)
- D—4th Section (Tucked Inside 3rd Section)
- E—5th Section (Tucked Inside 4th Section)
- F—Cheek Plates & Bolts
- G—Toggle & Bolts
- Smaller Towers May Have Only (3) Sections
While Larger Towers May have (6) Sections



One Year Limited Warranty

All of our towers/masts include a one year limited warranty on parts if installation is followed per these instructions.

MOST COST EFFECTIVE INSTALL: Tools Required

- A—(1) 120v Electric Winch with Strap (Clutchless Preferred)
- B—(1) Base Mounting Plate (to Attach to Winch to Lower Tower/Mast)
- C—(1) 1-Ton Forged Lifting Hook/Safety Clip to Attach to Bow Shackle (See Note and Configuration Top of Page 6)
- D—(1) 5/16 Inch Bow Shackle to Attach to Winch & Lifting Hook
- E—(1) 5 Inch OD Flat Belt Pulley
- F—(1) Lifting Strap (See Configuration Top Page 6)
- G—(1) Strap Clamp with Buckle
- H—(2) 10 Inch Spud Wrenches
- I—(1) Fish Tape 100 Foot
- J—(1) Emergency Manual Winch Crank
- K—(2) Magnetic Spirit Levels
- L—(1) 24 Inch Pipe Wrench (Aluminum if Available)
- M—(1) 24-30 Inch Steel Wrecking Bar
- N—(2) U-Bolts
- O—2 Inch x 10 Inch board 8 Feet Long (Optional—not pictured)
- P—(1) 10 Foot Heavy Duty Stepladder (not pictured)
- Q—Saw Horse (not pictured)
- R—Equipment to Drill 12 Inches x 6-7 ft Deep and Cement Base Section using Concrete. Most Fence Contractors Could Complete This Portion (not pictured)
- S—Ethernet / Cat 5 or Cat 6 Cable & Strain Relief (Usually Provided by your ISP) (not pictured)
- T—Conduit (Only if preferred, but not necessary) (not pictured)



Lifting Hook / Safety Clip and

5/16 Inch Bow Shackle

Configuration. Must remove

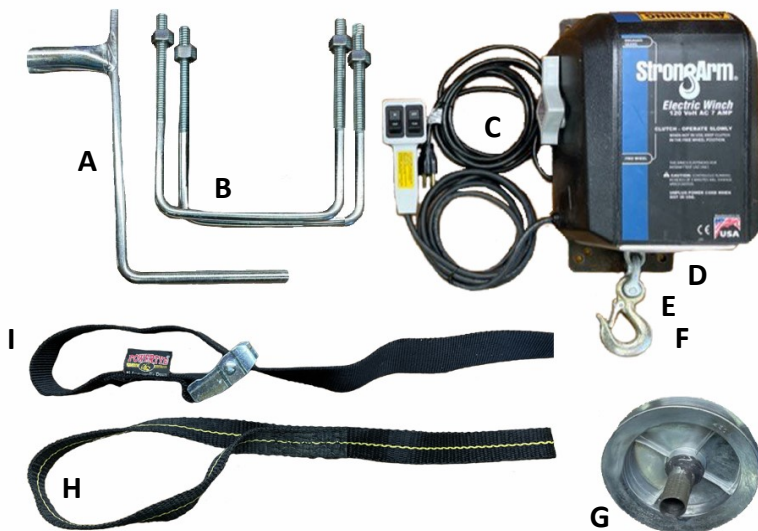
(break/cut off) Lifting Hook that comes with Winch to attach Bow Shackle and A Replacement Lifting Hook. NOTE: Adding the Shackle is a required component to prevent cable abrasion. This step is completed for you if purchasing the Installation Kit.



Lifting Strap Configuration for 2nd Section



DIY Installation Kit (Optional)



- A—Emergency Manual Winch Crank
- B—(2) U-Bolts 1/2 Inch x 5 Inches x 6 Inches
- C—120v Electric Winch with Strap
- D—Base Mounting Plate to Lower Tower/Mast (Attached to Back of Winch)
- E—5/16 Inch Bow Shackle (Attached to Winch)
- F—1-Ton Forged Lifting Hook/Safety Clip (Attached to Bow Shackle on Winch)
- G—5 Inch OD Pulley
- H—Lifting Strap (See top of page)
- I—Strap Clamp with Buckle

STEP 1. Select A Good Location.



- Please choose carefully and select a good location well away from power lines, parking lots and busy walk ways at a distance of the height of the tower plus 15 feet at a minimum especially for the service path.
- Avoid Structures. Consider the Distance to Point of Entry In the surrounding area within 200 feet.
- Call 811 “Call Before You Dig” to mark underground utilities before proceeding.
- Use a Hand-Digger to check for obstructions before power drilling.
- The tower will come pre-assembled with the sections placed

one inside the other. Confirm you have everything you need to get started. See page 5 of the Installation Brochure for a list of required tools. See www.b-pole.com for the latest information.

STEP 2. Drill Foundation Hole

IF YOU ARE UNFAMILIAR with this type of work, we recommend hiring a local fence contractor to help with Steps 2, 3 and 4.

- Using an auger, drill a 12 Inch outside diameter to either 6 or 7 Feet Deep depending on Tower Model chosen.
- Clear out dirt to bottom.
- 6 Feet Deep is minimum for all LM3 & LM4 Models
- 7 Feet Deep is minimum for all LM5 Models



STEP 3. Place Bottom Section in Hole



- *It may be helpful to use a 2 inch by 10 inch board that is 8 feet long to guide the Base Section into the hole.*
- *Set Base Section against the board.*
- *Carefully walk Base Section up (May take 3 persons) or use a loader.*
- *Don't stand under the Section while raising; use ropes if necessary.*
- *Center and Orient Base Section.*
- *Align the Base Section of The Tower / Mast so that it will fold down*

opposite Cheek Plates.

- *Conduit may be used if preferred but is not necessary. If preferred , this is the time to at least set the elbow that will go through the concrete. Conduit is not included with the Installation Kit.*

STEP 4. Plumb Base Section & Concrete



STEP 4—Continued

- Check premix concrete bag for mix and cure details. Mix Concrete according to package directions and begin to pour into the 12 inch hole. Spirit Level to Plumb (both directions) after one foot of Concrete Fill.
- Check Plumb after each foot of fill. Fill completely to 2 inches below grade.
- BE SURE of the orientation and plumb at this time as there is no adjustment later. If applicable, double check Conduit Section is appropriately in place.
- Allow concrete to cure for 2 to 3 days. Temperature affects curing time.



STEP 5. Install 2nd Section

- *Once concrete is cured, again check Base Section is Plumb.*
- *Using 10 Foot Stepladder, Install 5 Inch Pulley at end of base section.*
- *Use Supplied 5/8 Inch Bolt and Locknut.*
- *Snug but do not over-tighten Bolt.*
- *The Pulley should turn freely.*
- *Note position of step ladder is to the side of the Cheek Plates.*



STEP 6. Lift 2nd Section

- *The Bottom of 2nd Section has three holes.*
- *Place Winch opposite and below Cheek Plates.*
- *Place Toggle on 2nd Section 7.5 feet from the end with the holes.*
- *Snug the Grub Bolts.*
- *Attach Lifting Strap near bottom (See Page 6 for Configuration).*
- *Align 2 small holes horizontally with larger hole facing down.*
- *Attach Lifting Strap and winch section into position between Cheek Plates.*
- *Install ½ Inch Bolt through Cheek Plates and bottom section through outer most hole.*
- *Snug with ½ Inch lock nut.*



STEP 7. Winch 2nd Section To Vertical

- *Reinstall 5/8 Inch bolt, washers and lock-nut through Clevis and Toggle*
- *Relocate Lifting Strap to just below Toggle.*
- *Toggle is 7.5 feet above the base of 2nd Section.*
- *Winch 2nd section within about 4 Inches of Pulley.*



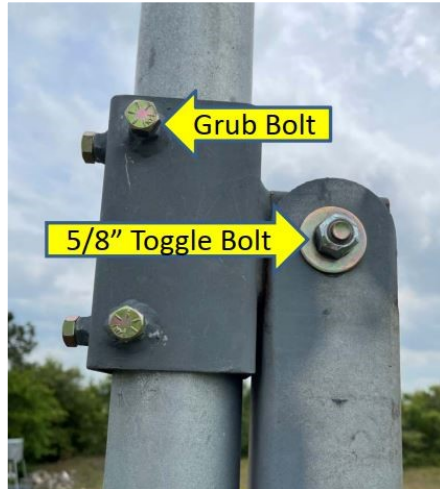
STEP 8. Attaching Toggle

- *Note installer's position is to the side of Cheek Plates.*
- *Snug Strap Clamp with Buckle around Base and Second Sections about 18 Inches below Pulley (See Page 6 for Configuration).*
- *Remove 5/8 Inch Bolt and Pulley.*
- *Loosen Toggle and lower into clevis at top of 1st Section.*
- *Reinstall 5/8 Inch bolt, washers and locknut through clevis and Toggle.*
- *Strap Clamp may be moved up or down to align holes.*
- *Tighten all four toggle bolts.*
- *Note that 2nd section remains bolted to Cheek Plates outermost holes.*



STEP 9. Toggle Connection Completed

- *The Toggle is in place with 5/8 Inch bolt, washers and locknut.*
- *Snug up locknut to the point where washers can't be turned by hand.*
- *Tighten the four ½ Inch Grub Bolts on toggle to about 30 foot pounds.*



STEP 10. Lowering 2nd Section

- *Move Winch to just below Cheek Plates on opposite side.*
- *Place Lifting Hook/Safety Clip through large hole in 2nd Section as shown.*
- *Check to be sure the Winch is ready.*
- *Remove the ½ Inch Bolt through Cheek Plates and 2nd Section.*
- *The load is now on the Winch.*
- *Reinstall ½ Inch Bolt through bottom Cheek Plate holes.*
- *Let out cable using winch to lower top of 2nd Section.*
- *Note position of installers to sides of Cheek Plates.*



STEP 11. Install 3rd and Subsequent Sections

- *Locate the 3rd Section. Mark a line 24 Inches from bottom end without Grub Bolts.*
- *Set ladder to side of 2nd Section, within reach of Grub Bolts. Loosen Grub Bolts several turns.*
- *Insert end of 3rd Section into 2nd Section to the 2 Foot line and tighten Grub Bolts to about 40 foot pounds.*
- *Adjust Winch to facilitate insertion of next Sections as applicable.*
- *Repeat these steps until all the sections have been attached.*



STEP 12. Running Cable and Ground

- *Once all the tower sections have been added, please proceed to run the cable and ground.*
- *Optionally, Ethernet Cable may be run inside tower/mast.*
- *Push Fish Tape through tower/mast from terminal end to pull cable and ground through.*
- *Install Strain Relief at top of tower/mast to support Ethernet Cable. This entire step or a portion of it may be provided by the Internet Service Provider.*



STEP 13. Insert Radio and Secure Cable

- *Adjust the Azimuth to approximate Final Compass Bearing.*
- *Note the Drip Loop.*



STEP 14. Raising & Securing the Tower/Mast

- Winch tower/mast to vertical. Tower/mast will bow quite a bit while near horizontal. This is expected.
- Stop Winch when 2nd section enters between Cheek Plates. Don't over pull.
- If necessary, use wrecking bar to align bottom of second section between Cheek Plates.
- If necessary, use Strap Clamp to pull section fully into position between Cheek Plates.
- Install $\frac{1}{2}$ Inch by $4\frac{1}{2}$ Inch Bolt through outermost Cheek Plate holes as shown to secure 2nd Section (DO NOT disconnect winch before this step is complete).
- NOTE – No bolts pass through 2nd Section.
- The bottom Cheek Plate Bolt is centered below 2nd Section .



STEP 15. Adjusting Azimuth While Tower Is Raised

- *Using stepladder, loosen the four Grub Bolts on the Toggle.*
- *There will be an audible “click” as the 2nd section drops to rest on the 1/2 Inch by 4.5 Inch center bolt (lower cheek plate bolt.)*
- *2nd Section is now resting on the bottom ½ Inch bolt through the Cheek Plates, and is free to rotate.*
- *Use the 24 Inch Pipe Wrench to engage 2nd Section above Cheek Plates, and rotate the section as needed to maximize signal strength.*
- *Re-tighten the 4 Grub Bolts on the Toggle to about 30 foot pounds.*
- *Install the (2) each 1/2 Inch by 1.5 Inch bolts nearest the Base Section and snug. Do not over tighten.*

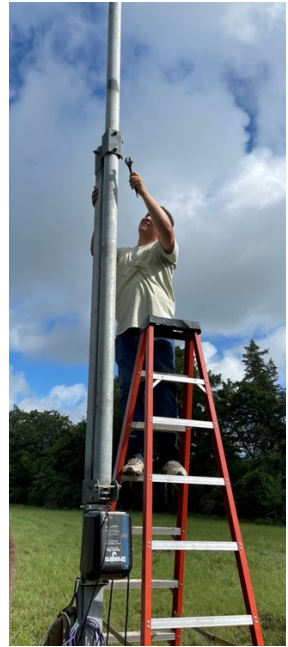


STEP 16. Lowering Mast & Preparing to Service the Radio: Center Lift Hole

- *Inspect the winch for damage and wear; install beneath the cheek plates.*
- *Check to be sure the large lift hole in 2nd section is centered between cheek plates and facing out so that the Lifting Hook can be inserted. See Configuration on Page 6.*
- *If not, loosen 2 rear Grub Bolts on cheek plates nearest base section.*
- *Loosen 4 grub bolts on toggle.*



- *Using a pipe wrench, rotate 2nd Section to center lift hole.*
- *Re-tighten 4 grub bolts on toggle, and connect winch hook. Be sure they are tight before lowering mast.*
- *Remove outboard (farthest from base) ½ Inch bolt through cheek plates.*
- *Let out a few inches of winch strap.*
- *Use pry bar to push bottom of 2nd section out until strap is tight.*
- *Stand to side of cheek plates while lowering mast.*
- *Winch mast to horizontal position.*
- *Let strap out and rest mast radio terminal end on sawhorse while servicing.*
- *Congratulations! You just installed and serviced your BEACON POLE TILT-OVER TOWER!*



***Please accept our appreciation from a VETERAN
OWNED, SMALL BUSINESS with TILT-OVER TOWERS
MADE IN THE USA***

We are a small, innovative Texas company employing modern CNC fabrication techniques and high strength materials to make sturdy free-standing towers / masts that can be installed, erected, serviced and adjusted from the ground without climbing.

We want you to be completely satisfied with your experience. If you have any questions about us, our products, or even shipping, please get in touch! We support you every step of the way. If there is an issue, our customer service staff is ready to help you over email or a phone call.

Beacon Pole, LLC
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A faded background image of a house with a porch, a dining table with chairs, and a large pile of autumn leaves in the foreground. The image is overlaid with horizontal lines, suggesting it is a template for a document or a page from a book.



Beacon Pole, LLC

Self-Supporting Tilt-Over Towers / Masts

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