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Tests on BIG RAK side load

60 in. (1.52 m) pipe out of the top of rotator
(66 in. [1.68 m] to centre of rotator) Moment Point

With 350 lbf. [1556.8 N] side load applied there was no detrimental effects.
This is approximately 1750 lb. ft. [2372.7 N m] of side load.

At 88 Mi/h [141.6 Km/h] assuming 30 lbs. / ft.^2 [1431.9 N/m^2] for air load (Using an old IEEE standard rule of thumb, NOT exact)
This would equate to about 58 ft.^2 [5.4 m^2] of antenna at 1 ft. [0.3 m] above the rotator.

Vertical load:
The vertical load capacity is greater than 500 lbs. [226.8 Kg, 2224.1 N]
(Note: that an antenna this big may develop very large torque and or momentum or flywheel effect). There are few antennas that are this large used in the amateur community, example, the MonstIR by SteppIR is only about 260 lbs. [117.9 Kg ,1156.5 N]

The vertical load is generally not an issue as the rotator will handle way more than most masts and towers.

Some things to consider when reviewing rotators and antennas:

- Antenna wind load is fine to determine if your tower and mast can survive, or a rotator if it is mounted outside the tower.
- Wind load ratings do not address how symmetrical the wind balancing is.
- If wind was straight, there would be no horizontal torque (if antenna was wind balanced.) only vertical torque on the mast.
  We know this is not true.
  How can you account for the swirling factor of wind?
- It does not say anything about the momentum the antenna builds up from its' movement in the wind.
  This is in addition to the force from the wind.
- Momentum or flywheel effect needs to take into account:
  the weight and mass of the antenna,
  and how far from the center it is mounted,
  and how fast it is moving.
- The momentum and/or flywheel effect is the shock load that breaks rotators.
- You can have several antennas with same wind load but they could have vastly different rotational torque profiles when measured at the rotator joint.

- **Wind Load:** A unclear defined standard with many different methods used to express the loading on an antenna due to wind, typically expressed in pounds per square inch or square feet. This often does not take into account: density of air due to humidity, elevation, airborne particles such as sand, water and ice as well as several other factors such as icing on the antenna. It is a poor method of determining the loading on an antenna or rotator due to the non-standard way in which manufacturers rate the antennas and rotators. If there were a standard method of defining the way to measure this value and if all manufactures used this method, then it would be OK.

