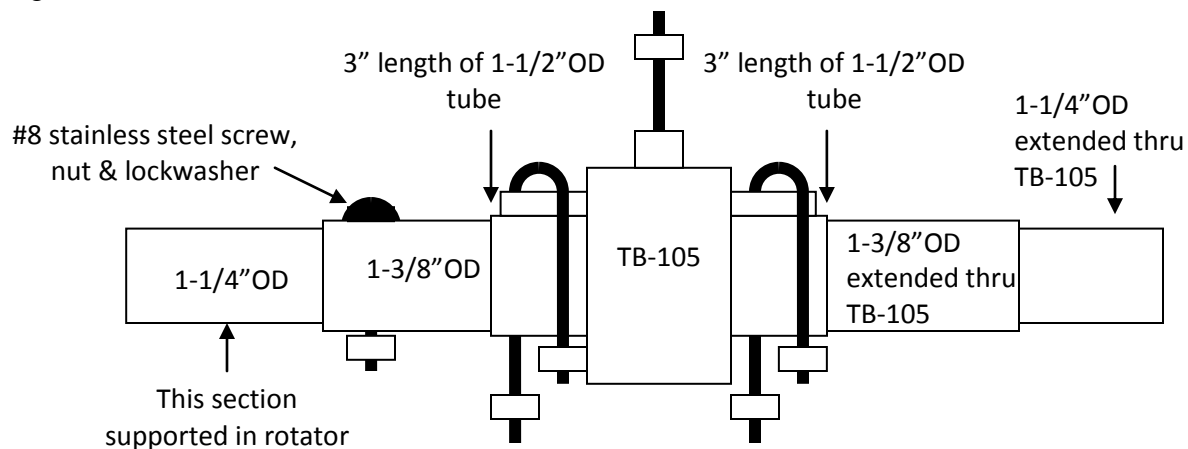


Using the inexpensive TB-105 Thrust Bearing with low-cost rotators
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The NTE/ECG U-105 rotator is very popular in the TV world. This rotator is also sold under the Phillips, RCA, HyGain and other brand names. Because it is inexpensive, many of these rotators are used for light-weight ham antennas as well. According to the U-105 data sheet, you can use a 1-1/8"OD to 2"OD mast, and the antenna/mast vertical load can be up to 100 pounds. However, this is a pretty small rotator and putting 100 pounds of weight on it seems like a real stretch. And there is no information on acceptable lateral forces. However, NTE/ECG also sells their TB-105 thrust bearing (they call it a "support bearing"), which is available from about \$24-\$35 from various sources. Like any other thrust bearing, the TB-105 can essentially eliminate rotator vertical forces, and significantly decrease rotator lateral forces.

I have a HyGain AR-35 rotator (same as the U-105) and a 4-element 6-meter beam that I wanted to mount to my chimney, and the TB-105 made a lot of sense to me to keep my rotator healthy. But there is virtually no information on how to employ the TB-105. It doesn't even come with instructions! The only drawing I found shows a 1.5"OD mast going through the TB-105. However a 1.5"OD tube will NOT pass through the TB-105. And a 1-3/8" mast is too small and winds up wobbling in the TB-105 as it is off-center when tightened in place. Further, you must also ensure that the mast attached between the U-105 and TB-105 is concentric with both units or there will be wobbling of the mast during rotation, which will put stresses on the TB-105 and U-105 bearings. Therefore, I set out to figure out how to properly interface these two units.

I experimented with several different mast sizes, and I finally found that a 1-1/4"OD tube centers perfectly in the rotator and the TB-105. But this OD is too small for the TB-105 so the 1-1/4"OD tube needs to be sleeved-up to properly fit the TB-105. Again, 1-3/8"OD is too small, and 1-1/2"OD is too large. However, while a 1-1/2"OD tube will not pass through the TB-105, it turns out that a 1-1/2"OD tube will fit into the upper and lower openings of the TB-105. Therefore, my final solution was to use a 1-1/4"OD tube inserted into the rotator. This was then sleeved-up to a 1-3/8"OD tube above the rotator, with the tube extending through the TB-105. Two 3" lengths of 1-1/2" lengths of tubing were then placed over the 1-3/8"OD tubing just below and just above the TB-105, and slid into the upper and lower TB-105 openings. The figure below shows the details.



U-105/TB-105 Tubing Requirements

I used a 1-1/2" #8 stainless steel screw, split-ring lockwasher and nut to affix the 1-1/4" tube to the 1-3/8" tube. The clamping action of the U-bolts on the TB105 distorts the 1-1/2"OD tubes such that they are effectively locked to the 1-3/8"OD mast. The photo below shows the AR-35/TB-105 assembly mounted to my chimney. With the tubing specified, rotation of the mast and antenna is smooth and wobble-free.



For many VHF and UHF beams, and smaller HF rotatable dipoles and beams, an inexpensive TV rotator may be all you need. However, to ensure trouble-free and long-life of the rotator, adding the TB-105 thrust bearing may be in order.