Often, a light-duty TV rotator is all you need for a small ham antenna. But sometimes, even a small ham antenna can push a TV rotator toward its load limits. As AD5X shows us, adding a thrust bearing can sometimes be the solution to a "too close for comfort" situation.

Using the Inexpensive TB-105 Thrust Bearing with Low-Cost Rotators

BY PHIL SALAS,* AD5X

The NTE/ECG U-105 rotator is very popular in the TV world. This rotator is also sold under the Phillips, RCA, Hy-Gain, and other brand names. Because it is inexpensive, many of these rotators are used for lightweight ham antennas as well. According to the U-105 data sheet, you can use a $1^1/_8$-inch OD (outside diameter) to 2-inch 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. Also, there is no information on acceptable lateral forces. However, NTE/ECG also sells the TB-105 thrust bearing (the company calls it a "support bearing"), which is available for about $24 to $35 from *CQ* advertisers. Like any other thrust bearing, the TB-105 essentially can eliminate rotator vertical forces and significantly decrease rotator lateral forces.

I have a Hy-Gain 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-inch OD mast going through the TB-105. However a 1.5-inch OD tube will *not* pass through the TB-105. A $1^3/_8$-inch 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 $1^1/_4$-inch OD tube centers perfectly in the rotator and the TB-105. However, this diameter is too small for the TB-105, so the $1^1/_4$-inch OD tube needs to be sleeved-up to properly fit the TB-105. Again, $1^3/_8$-inch OD is too small, and $1^1/_2$-inch OD is too large. On the other hand, while a $1^1/_2$-inch OD tube will not pass *through* the TB-105, it turns out that it will fit *into* the upper and lower openings of the thrust bearing.

Therefore, my final solution was to use a $1^1/_4$-inch OD tube inserted into the rotator. This was then sleeved-up to a $1^3/_8$-

Photo A– The TB-105 and AR-35 mounted on the author's chimney. The TB-105 is at the very top of the lower mast section.

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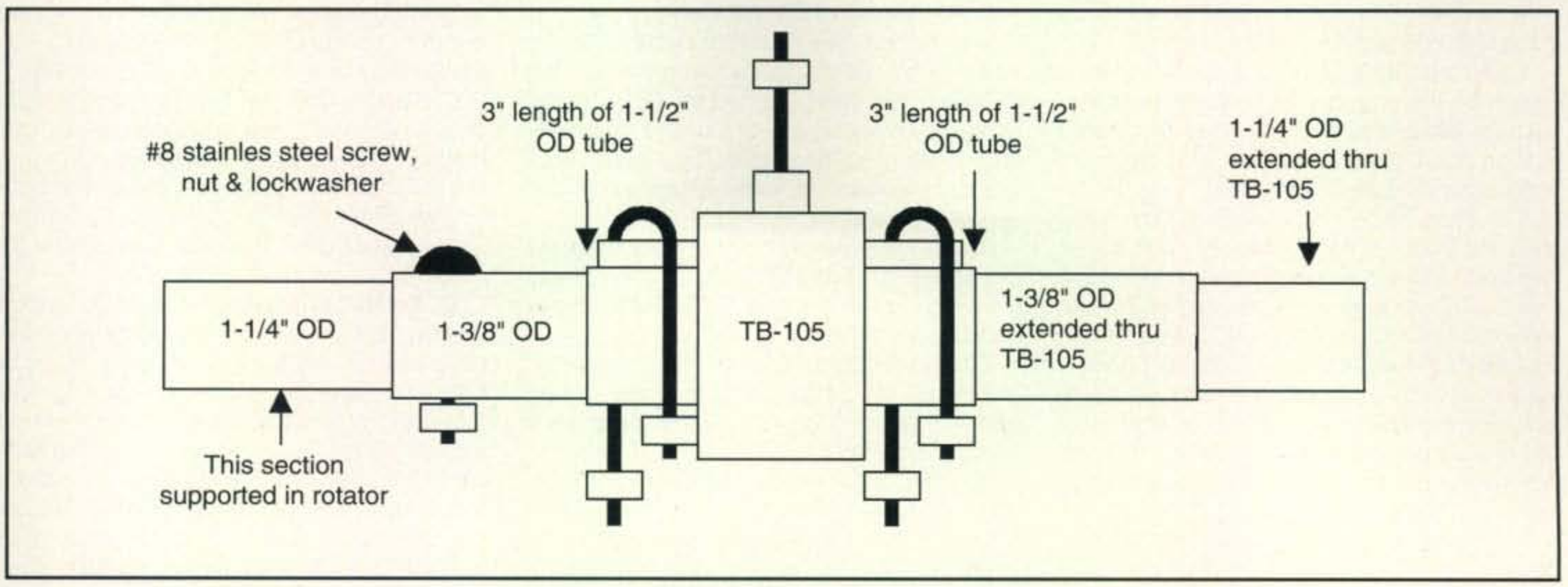

Fig. 1– U-105/TB-105 tubing requirements.

inch OD tube above the rotator, with the tube extending through the TB-105. Two 3-inch lengths of $1^1/_2$-inch OD tubing were then placed over the $1^3/_8$-inch OD tubing just below and just above the TB-105, and slid into the upper and lower thrust-bearing openings. Fig. 1 shows the details.

I used a $1^1/_2$-inch #8 stainless steel screw, split-ring lockwasher, and nut to affix the $1^1/_4$-inch tube to the $11^3/_8$-inch tube. The clamping action of the U-bolts on the TB105 distorts the $1^1/_2$-inch OD tubes such that they are effectively locked to the $1^3/_8$-inch OD mast. The photo shows the AR-35/TB-105 assembly mounted to my chimney. With the tubing specified, rotation of the mast and antenna are 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.