Another Dish Tripod

By Edward Cole – KL7UW

Your saying: “What? Another dish tripod article”?

Like many other microwaver’s I’ve used camera tripods which typically are too light-weight and fragile to support even a modest dish. I’ve also used small triangular TV mast supports but offer no leveling for use on uneven ground. So Many have said “Get a professional tripod or one of those heavy-duty video camera types”.

Not much is available living up here in Alaska, so my thinking went toward a surveyor’s tripod. My upcoming participation in the 10-GHz ARRL Microwave Contest on the Upper Peninsula (UP) of Michigan made finding a suitable tripod more than idle thinking.

So, I went to our local professional hardware store (that also caters to surveyors) and purchased a bare surveyor’s tripod. I was pleasantly surprised to find it cost about $50. I was expecting double or triple that. I got a Spectrum Precision model 2161.

It is made of aluminum alloy with three flat legs 3 inch wide by ¾ inch thick. They are thirty-six inch long, with legs retracted, and sixty inch fully extended. Tripod has cam-levers to lock the legs. Each leg is tipped with a conical metal point which is handy for mounting on/in soil, but skittish on hard surfaces. I might look for rubber tips to use on concrete surfaces.

Spreading the retracted legs 40-inch apart places the tripod table 30-inches above ground, which will be nice if operating from a folding chair. Thirty inches is standard desk height. The azimuth and elevation mechanisms raise the base of my dish ten inches higher with my KX3 attached to back of dish another ten inches higher (total 50-inches above ground with retracted legs). All the electronics will be attached to either dish back or near the feedhorn (to keep 141 semi-rigid coax short).

I’m using an 18-inch offset fed DSS satellite dish (very popular amongst microwaver’s). Details of the electronics, dish and feed are viewable at http://www.kl7uw.com/10g.htm.

While thinking of field use of the tripod/dish, I considered the problem of pointing. Camera tripods usually come with a “pan and tilt” mechanism which is accomplished with a handle and some manner of locking. Knowing that the 18-inch dish beamwidth on 10-GHz is about 3-degrees, I wanted something better. I immediately though of some kind of gear-driven mechanism to execute azimuth and elevation movement in subtle way.

So, I used Google search and E-bay search. For azimuth I decided on a new precision 4-inch milling rotary table found on e-bay for $70. A little bit extravagant but it provides worm gear azimuth motion with ten degrees rotation per revolution of the Vernier dial which is divided with 1/6 degree “ticks”.

The rotary table attaches to the tripod via a 5/8 inch threaded bolt in the center of the tripod table. I drilled and tapped a 4-inch square of ¼ inch aluminum plate to hold the rotary table which is held with four bolts to the plate.

For adjusting elevation angle, I found a vintage worm gear driven camera tripod mount made by Majestic. Apparently considered by camera buffs as a "classic". I only found one on e-bay and they are probably rare. This is probably very difficult to find so would make it hard to duplicate. Cost $60.

The base has four feet with bolt holes. I found if I used 5/16 inch bolts with their heads inserted into the rotary table hold-down slots, I could attach the Majestic to the table using two opposite feet. This quite adequate to hold both dish and elevation mount.

The Majestic uses a crank to turn a helical drive gear for fine elevation control. Elevation will be indicated by a digital level as the crank has no markings.

The tripod with 2w DEMI 10-GHz system and KX3 2 meter IF will be tested at the Microwave Antenna Range, Friday morning of the Conference. If a secure location is found, it also may be viewed during the meeting hours (perhaps in the Vendor area where we will have a table for Dubus Magazine).

Fig. One – complete tripod with azimuth, elevation and dish attached.
Fig. Two – Close view of rotary table.
Fig. Three – View of both rotary table and elevation unit.


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