

Cheap AZ-EL Antenna Positioner

By W5IU

Two pictures in the last CQ VHF column illustrated the “Cheap AZ-EL Positioner” being used first to support a Kent Britain “Cheap 70 cm Yagi” in support of AO-51 data gathering and second to support two Cheap Yagis in support of satellite contacts at the NTBP Balloon Launch. These pictures prompted several questions so here is a little more detail on the positioner. The complete positioner without antennas is shown below. It is mounted on a standard Radio Shack 3 ft. tripod, and it consists of several parts as follows.



Complete Positioner: Complete Positioner Assembly Mounted on Tripod, Dish mounts on Right, Yagi on Left (note Azimuth Pointer)

The "Horizontal Boom" (overall length 24") is actually made of several parts. It is made from two pieces of 1" PVC glued into a 1" PVC T. Inside the boom is a 24" length of 1" wooden dowel for added strength (this primarily prevents crushing the PVC pipe when antenna clamps are tightened) and to provide a place to attach the elevation protractor and indicator (fishing leader and weight) with a stud (wood screw on one end and machine screw on the other).



Boom & Support: Horizontal Boom and Positioner Arm on Left showing wooden dowel and Elevation Indicator Assembly, Elevation Bearing Assembly on Right (note Hose Clamps for Friction Adjustment)

A "Positioning Arm" is made of 1" PVC, just like the Horizontal Boom. It is glued to the 1" PVC T that forms part of the Horizontal Boom and is closed with a 1" PVC cap. Inside the Positioning Arm is a combination of 1" wooden dowel and lead shot to form the appropriate counterweight.

Support for this "Horizontal Boom" is provided by an assembly of a 1 1/4" PVC T and two pieces of 1 1/4" PVC pipe. The two pieces of 1 1/4" PVC pipe are glued into the 1 1/4" PVC T. One of these pieces is hard to see and is actually only a "bushing" on one end of the 1 1/4" T. The longer piece of 1 1/4" PVC is "slotted"

with a Hack Saw so that it, along with a hose clamp, forms the elevation friction adjustment.



Positioner: Assembly of Horizontal Boom and Elevation Bearing

The 1" PVC assembly passes through the 1 1/4" assembly which becomes the elevation bearing with a friction adjustment as mentioned above. I chose 24" as an overall length and originally clamped a 2' by 3' BBQ Grill Dish and Down Converter to the short end of the 1" PVC assembly (next to the "bushing" end of the 1 1/4" PVC T). The longer end (next to the 1" PVC T) was used for the 70 cm "Cheap Yagi"

The "Azimuth Assembly" consists of a 1" PVC pipe clamped into the tripod and 1 1/4" PVC slipped over it and glued to the 1 1/4" PVC T that also includes the elevation bearing. The azimuth protractor is mounted on a piece of wood and the assembly drilled so that it will slide over the 1" PVC pipe attached to the tripod. The 1 1/4" azimuth (vertical) pipe is also "slotted" with a Hack Saw and equipped with a hose clamp to form an adjustable azimuth friction adjustment. An aluminum pointer is clamped to the vertical piece of 1 1/4" PVC by the friction adjustment hose clamp and extends out to the azimuth protractor.



Tripod: Radio Shack Tripod showing Azimuth Bearing Post and Azimuth Indicator