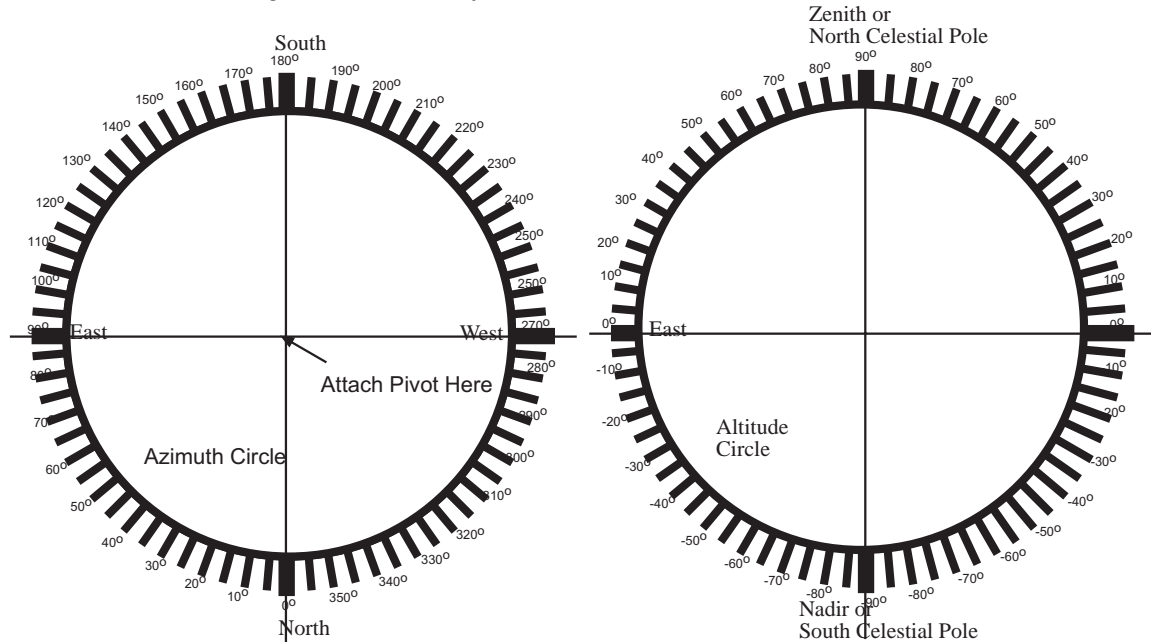


## Building the Altitude/Azimuth Pointer

This pointing device is used in several of the observing projects. It is used to measure the direction to celestial objects.

Materials: Cardboard, string or thread, one or more buttons or small weights (clay or pebbles might work), copies of the Altitude-declination layout and of the Azimuth layout, a soda straw, a piece of wire or a pipe cleaner, small box like from a video cassette or shoe box, possibly paper fastener, glue for paper (like a glue stick or rubber cement)

1. Print out the Altitude-declination layout and the Azimuth layout. Cut out the Altitude layout outside of all the writing. The Azimuth layout need not be cut out.



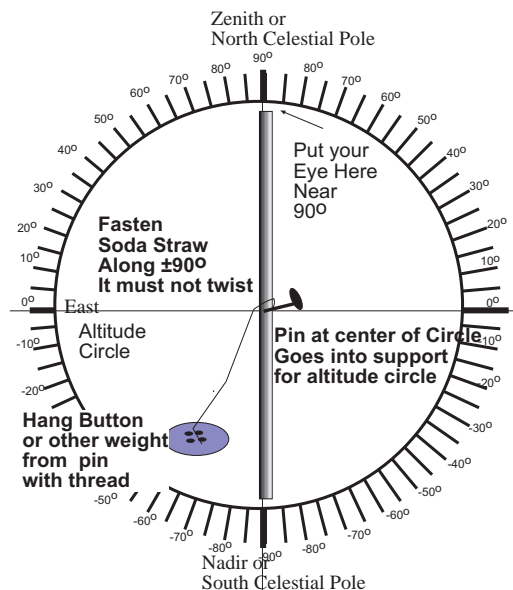
2. Mount the Altitude-declination and the Azimuth circles on stiff cardboard (like corrugated).

3. Attach a soda straw along the  $\pm 90^\circ$  line on the Altitude circle. Attach the straw so that it cannot move, but so that you CAN see through it as you look from one end. It is important that the straw is accurately positioned along the  $\pm 90^\circ$  line.

4. Attach a button or small weight to a thread or string and tie the thread to a pin. Insert the pin through the soda straw at the very middle of the soda straw.

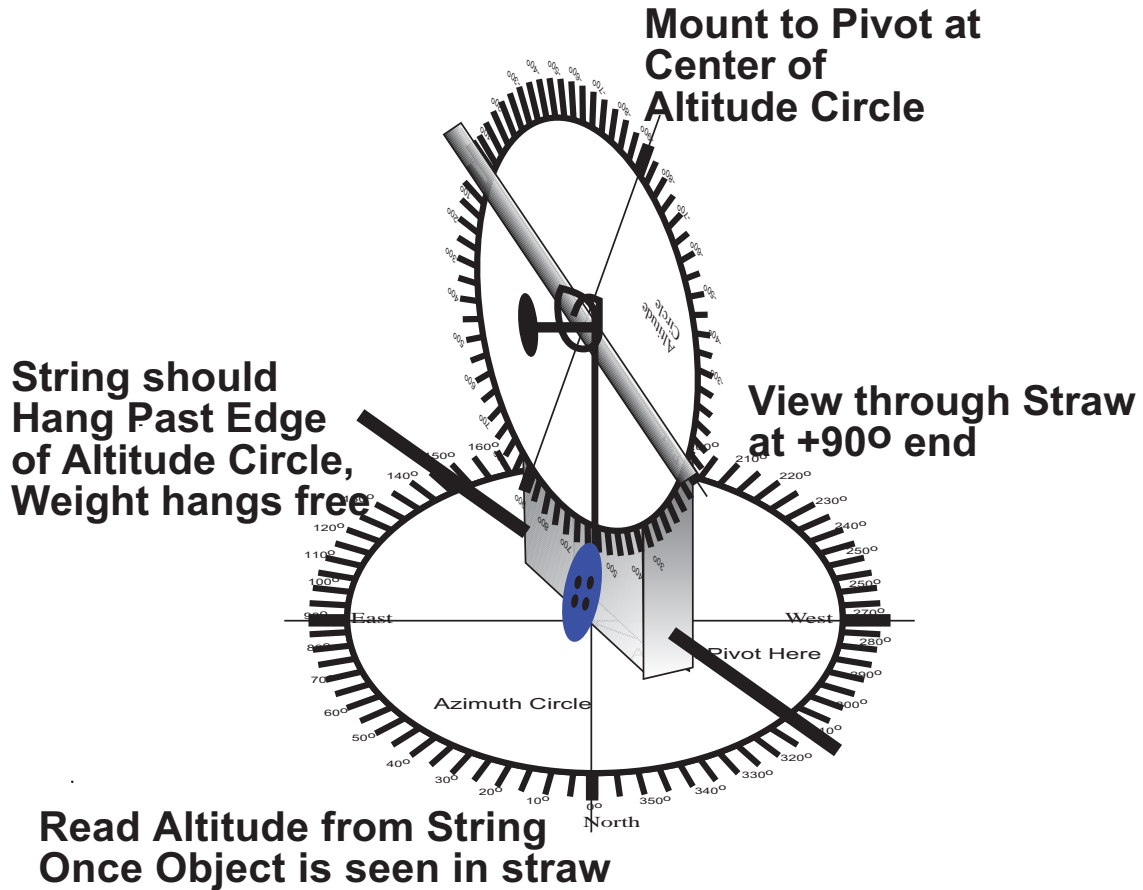
5. Attach a box to the Azimuth circle at the pivot point so that it can pivot. You can use a paper fastener, thread and two buttons, or a plastic fastener like the ones used to attach tags to clothing. The point of the box is to support the Altitude circle at a right angle to the azimuth circle and to be able to pivot around the center of the Azimuth circle.

6. Put a stiff wire or a pipe cleaner through the middle of the box, so that it indicates that direction



of the box.

7. Attach the Altitude circle, with the pin and weight to the box so that it pivots around the center of the Altitude circle. The completed Altitude/Azimuth pointer should look like the figure below.



#### HOW TO USE THE ALTITUDE/AZIMUTH POINTER.

- A. Place the altitude circle (base) on a horizontal circle. Line up 0o to North. Instructions for finding North are given in “setting up your horizon circle”.
- B. Look through the end of the straw that is near -90o and find your object of interest in the straw.
- C. Azimuth Angle is the angle indicated by the wire or pipe cleaner AWAY from your face  
Altitude Angle is the angle under the string  
When you record Altitude and Azimuth, always record the time and date as well.