

After selecting Body₁, visualize that you are standing at the center of a 12 hour clock face and the vertical circle from your zenith passing through Body₁ intersects the horizon at the 12 o'clock position. Select Body₂ from a vertical circle that intersects the horizon at or near the 8 o'clock position and Body₃ from a vertical circle that intersects the horizon at or near the 4 o'clock position, this will produce the optimum crossing angles at the intersection of the 3 circles

Three Body Fix Using Intersections of Circles of Equal Altitude

Enter data into yellow cells

Date @ Greenwich Day Month Year

Body₁ Limb GMT₁

GHA₁ deg. min

Dec₁ deg. min.

Ho₁ deg. min

Body₁ is of the observer

GP of Body₁ Lat 19° 05.5' N Lon 41° 59.7' W

Radius of the Circle of Equal Altitude 2326 n. mi.

Body₂ Limb GMT₂

GHA₂ deg. min

Dec₂ deg. min.

Ho₂ deg. min

Body₂ is of the observer

GP of Body₂ Lat 60° 54.8' S Lon 35° 54.1' W

Radius of the Circle of Equal Altitude 3288 n. mi.

Body₃ Limb GMT₃

GHA₃ deg. min

Dec₃ deg. min.

Ho₃ deg. min

Body₃ is of the observer

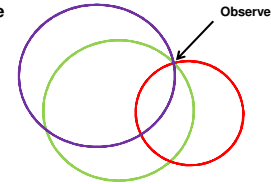
GP of Body₃ Lat 8° 55.3' N Lon 41° 48.4' E

Radius of the Circle of Equal Altitude 3513 n. mi.

Observer's position determined from the intersections of Circles of Equal Altitude

Observer's Latitude deg. min

Observer's Longitude deg. min



Click to view 2 Body Fix Using Intersections of Circles of Equal Altitude

This worksheet assumes all sights were taken from the same geographic position.

A Circle of Equal Altitude

A Circle of Equal Altitude (CEA) is centered at the Geographic Position (GP) of a Body. The Latitude of the body's GP is defined by the body's Declination (Dec). The Longitude of the body's GP can be determined from the body's Greenwich Hour Angle (GHA). The radius of a Circle of Equal Altitude in nautical miles is $60 \times (90^\circ - Ho)$. When three bodies are observed, the three Circles of Equal Altitude will have six intersections.

Select Intersections to Use in Calculating Fix
 If the sights were "accurate", three of the intersections listed below will be at or near the observer's geographic position.

<p>Intersection 1</p> <p>Use Intersection 1 in Calculating Fix <input type="text" value="Yes"/></p> <p>Body₁ & Body₂</p> <p>Lat <input type="text" value="8"/> deg. <input type="text" value="30.30"/> min <input type="text" value="S"/></p> <p>Lon <input type="text" value="14"/> deg. <input type="text" value="21.31"/> min <input type="text" value="W"/></p>	<p>Intersection 3</p> <p>Use Intersection 3 in Calculating Fix <input type="text" value="No"/></p> <p>Body₁ & Body₃</p> <p>Lat <input type="text" value="48"/> deg. <input type="text" value="6.91"/> min <input type="text" value="N"/></p> <p>Lon <input type="text" value="10"/> deg. <input type="text" value="10.23"/> min <input type="text" value="W"/></p>	<p>Intersection 5</p> <p>Use Intersection 5 in Calculating Fix <input type="text" value="Yes"/></p> <p>Body₂ & Body₃</p> <p>Lat <input type="text" value="8"/> deg. <input type="text" value="30.90"/> min <input type="text" value="S"/></p> <p>Lon <input type="text" value="14"/> deg. <input type="text" value="18.58"/> min <input type="text" value="W"/></p>
<p>Intersection 2</p> <p>Use Intersection 2 in Calculating Fix <input type="text" value="No"/></p> <p>Body₁ & Body₂</p> <p>Lat <input type="text" value="11"/> deg. <input type="text" value="0.80"/> min <input type="text" value="S"/></p> <p>Lon <input type="text" value="17"/> deg. <input type="text" value="11.81"/> min <input type="text" value="W"/></p>	<p>Intersection 4</p> <p>Use Intersection 4 in Calculating Fix <input type="text" value="Yes"/></p> <p>Body₁ & Body₃</p> <p>Lat <input type="text" value="8"/> deg. <input type="text" value="28.36"/> min <input type="text" value="S"/></p> <p>Lon <input type="text" value="14"/> deg. <input type="text" value="19.31"/> min <input type="text" value="W"/></p>	<p>Intersection 6</p> <p>Use Intersection 6 in Calculating Fix <input type="text" value="No"/></p> <p>Body₂ & Body₃</p> <p>Lat <input type="text" value="46"/> deg. <input type="text" value="17.89"/> min <input type="text" value="S"/></p> <p>Lon <input type="text" value="63"/> deg. <input type="text" value="34.89"/> min <input type="text" value="E"/></p>