

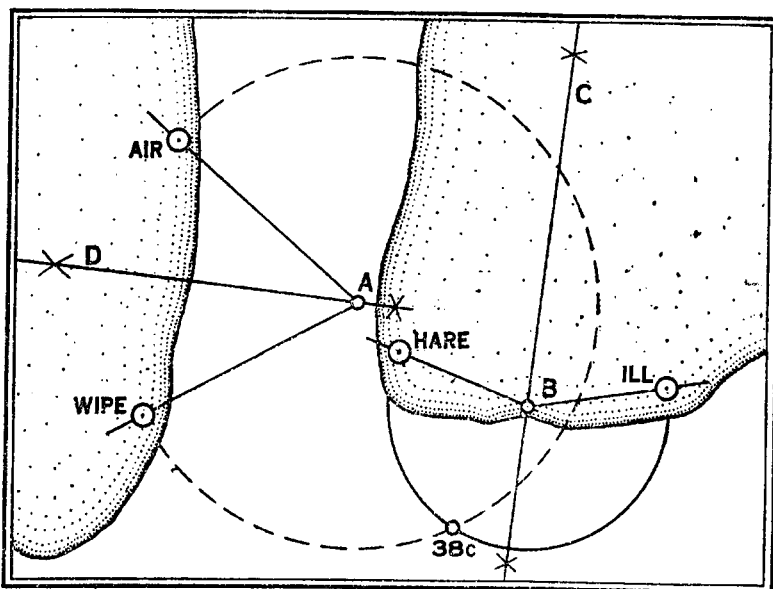
OBTAINING A FIX WITH NO COMMON CENTRE OBJECT

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The *Hydrographic Manual* of the Coast and Geodetic Survey provides for the solution of a fix where the two angles are not observed on a common centre object. Paragraph 7625 recommends that this be accomplished by plotting the locus of each angle at random points near the probable intersection, and sketching in the arcs, the intersection of which is the desired position.



The following solution, although perhaps more complex, is offered because it is believed to be more exact and may be desirable to use under certain circumstances. Figure 1 illustrates the method for a position 38c at which angles were observed between objects ILL and HARE and between AIR and WIPE.

1.—Establish the perpendicular bisectors BC and AD for lines ILL-HARE and AIR-WIPE, respectively.

2.—Set the angle between ILL and HARE on the right arm of the three-arm protractor, and the angle between AIR and WIPE on the left arm, in the usual manner.

3.—Make the fiducial edge of the fixed arm of the protractor coincide with the line BC and move the protractor until its right arm passes through station ILL. The centre of the protractor will then be on the perpendicular bisector of the line ILL-HARE and at the exact centre of the circle whose radius is B-ILL. Locate this centre with a pricker point, and using the radius B-ILL, describe a circle through stations ILL and HARE.

4.—Follow the same procedure for the left angle, using the perpendicular bisector AD and station WIPE, and describe a circle through station AIR and WIPE with radius A-WIPE.

5.—The intersection of the two circles at 38c is the desired position.

It is suggested that all steps outlined above be performed on a tracing overlay and that the final intersection only (position 38c) be pricked through for establishment on the smooth sheet.

The centres A and B may also be obtained by using the expression.

$$c = \frac{a}{\sin A}$$

where a is one-half the distance between stations, A the sextant angle, and c the radius of the desired circle. Use a metre-bar and set the distance c on a pair of dividers. If one leg is placed at either station concerned, the other will intersect the perpendicular bisector at the centre of the circle.

