just about every shore station within hearing also starts to call ships, resulting in a complete jamming of communications.

If, as Professor Hugon has suggested, the use of v.h.f. were extended a more rigid control of radio traffic on v.h.f. would have to be enforced. An aircraft equipped with a v.h.f./d.f. set would soon be able to detect the offenders, especially of the animal and bird-call type and those who at times re-broadcast music. I am convinced they are not entirely ship-borne offenders, as one often hears the same type of noise in an apparently similar voice in the same area time after time.

A Geometrical Construction for Horizontal Angle Fixes

T. R. Meaden

THE method here described for finding the position of an observer from horizontal angles to fixed marks, without the use of a station pointer and without the necessity of drawing position circles, was devised by the author and although it may not be original it may be of interest to other navigators.

In Fig. 1 the observed horizontal angles are APB $= \theta$ and BPC $= \phi$ where A, B

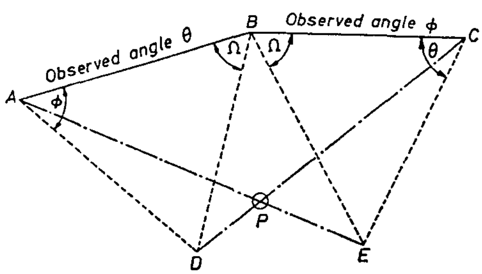

FIG. 1

and C are the fixed marks. Join AB and BC. Let $\Omega = 180 - (\theta + \phi)$. Draw the angles $\angle$ABD and $\angle$CBE each equal to Ω. Draw the angles $\angle$BAD $= \phi$ and $\angle$BCE $= \theta$. Join AE and BD. Their intersection at P is the required point of observation. If $(\theta + \phi)$ exceeds 180° a slightly different construction is necessary and is shown in Fig. 2, where $\Omega = (\theta + \phi) - 180°$.

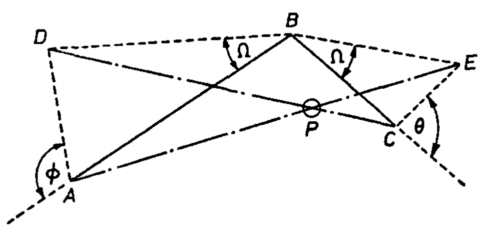

FIG. 2

The proof of the construction where $(\theta+\phi)$ is less than 180° is illustrated in Fig. 3, where A, B and C are, as before, the observed marks and P is the required position. AP is produced to cut the circle through BCP in E and CP is produced to cut the circle through ABP in D.

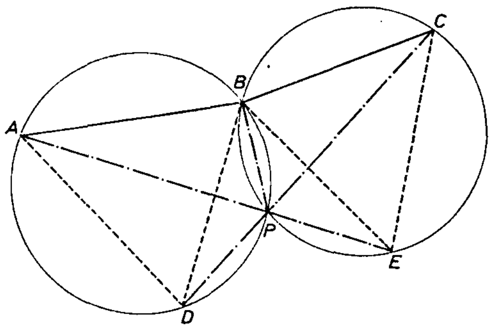

FIG. 3

Now $\Omega = \angle ABD = \angle APD$ (since they are both subtended by the chord AD; Euclid III.21):

$$\angle APD = 180° - (\angle APB + \angle BPC)$$

$$\therefore \quad \Omega = 180° - (\theta + \phi).$$

Similarly $\Omega = \angle CBE = \angle CPE = 180° - (\theta + \phi)$.

In the cyclic quadrilaterals ABPD and CBPE:

$$\angle BAD = \angle BPC = \phi$$

$$\angle BCE = \angle BPA = \theta \text{ (Euclid III.22).}$$

A similar proof is applicable to the case where $(\theta+\phi)$ exceeds 180°.

Although in practice this method is no quicker to plot than other recognized methods, it does have the advantage of not requiring compasses. The construction is easily performed with a parallel ruler from the compass rose on the chart, but a circular or Douglas protractor is much more convenient.

The author wishes to thank Inst. Lt. Rickards, R.N. for reading the original paper and suggesting a clearer presentation.

The Calculation of Position Line Data with a Computer Calculator

Henry L. Podmore

As a result of the recent marketing of small pocket computers I have found much interest among navigators who would like to use them for working out

https://doi.org/10.1017/S037346330002573X Published online by Cambridge University Press