



NATIONAL SCHOOL  
SAILING ASSOCIATION

**THE  
"AL KEMAL"**

**Curriculum  
Development  
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## THE AL KEMAL

The first means of navigating a ship to a given latitude by reference to the heavenly bodies is generally thought to have been evolved by the Arabs. Tradition has it that the Portuguese in the time of Henry the Navigator learned the art from a captured Arab slave, who before his capture by pirates and subsequent enslavement had been the Arab equivalent of a Merchant Venturer. The story is well told in Frank Slaughter's "The Map-Maker" - extracts from which would repay reading in any sailing fraternity.

Whatever may be the truth of the matter, as regards the Portuguese, it is certain that the primitive instrument known as the "Al Kemal" was still in general use by Arab trading dhows in the last century.

The instrument consisted of a wooden tablet to which was attached a leather cord. Knots were tied in this cord in such positions that when the tablet was held in front of the face and the knot held in the teeth, the lower end of the tablet was lined up on the horizon, whilst the upper edge was aligned on a given star. It is doubtful if the Arabs would have used the Pole star for their navigation close to and across the equator, but the memorisation of the relative positions of a few more useful stars to them, would have presented no great problem. Once a ship had visited a port and the navigator had tied a knot in the cord, it would be possible on any future occasion to revisit that place by sailing Southwards until the "Al Kemal" indicated the appropriate latitude and then turning Eastwards (or Westwards) until the land was encountered. As it was for navigating from Portugal down the coast of Africa that the method was widely used by the Portuguese, it represented a

very simple and relatively accurate method. In order to render the instrument easier to handle, in practice, several tablets of differing heights were carried.

This instrument has inspired the development of a simple "gadget" useful to the yachtsman for estimating more accurately his distance off-shore, without the aid of a sextant.

All that is required is a ruler with a scale of millimetres marked along one edge. A hole is drilled at one end to take a cord which is then knotted to prevent it slipping through the hole. At a point 60 cms. from the ruler a knot is tied. The method of using this modern "kernal" is to hold the ruler vertically with the knot in the cord held between the teeth (or against the bridge of the nose). The ruler is aligned with an object whose height is known from the chart and the thumb moved down until the apparent height on the millimetre scale is noted. Distance off shore in cables is then obtained by dividing the height of the object observed (measured in feet) by the apparent height (measured in millimetres) . The mathematics of the calculation will be apparent by reference to a diagram and the study of similar triangles. A cable = 600 feet.

This might afford an excellent use for old rulers, apart from providing an interesting half-hour's work in construction and resulting in a useful navigational aid for the cruising yacht or dinghy.

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