

obtained by any other method, leeway angles recorded in log-books are of doubtful value. Ships' officers have no check on the validity of their estimated leeway.

At first glance it would appear that the speed made good through the water, OB, could be derived from the speed over the ground, OD, and an allowance for the current, BD. But in practice the only current data readily available are in chart form with too small a scale for each day's run to be considered accurately. Further, current charts are compiled from averages of hundreds of ship records, some going back to the nineteenth century; for many of these records the unaccounted leeway will distort the currents calculated. Small errors in estimating the leeway angle can result in considerable directional errors in the currents and it is therefore possible that current charts may simply reflect the wind patterns of the world. The similarity between the current charts and the prevailing wind charts is, after all, quite striking. Recent research suggests that currents are not a continuous flow of water but rather eddies varying in diameter, and thus giving changing velocities and directions with both time and position. This is not the whole story, the effects of the sea and swell on the ship are a far more complex problem, nor have the amount and frequency of rudder movements been considered. These all take their toll of power from the engines, as will the fouling and roughness of the hull. It is hoped that this article may bring to the attention of ships' officers some of the problems facing analysts who have to sift through log-book data.

Wheelhouse Design

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THE basis of wheelhouse design is comprehended in that wonderful Anglo-Saxon word—sea-man-ship. For the design of a wheelhouse should be such that the three elements in a mariner's work—the sea, the man and the ship are linked together in the most efficient manner. At all times and in all positions in a wheelhouse the mariner should have a clear view of the scene outside and also have as many clues as possible to the direction of the ship's head—so that he may relate the ship's head and the outside situation as easily as possible.

Figure 1 depicts the wheelhouse of M.V. *Conister* of the Isle of Man Steam Packet Co., Ltd. as seen from the after end centre, 12 ft. abaft the windows. The following points may be noted:

- (i) The deck of the wheelhouse slopes forward about 2° from the horizontal due to the sheer of the hull. This permits the fo'c's'le to be clearly visible, even when standing at the after end, and the sea near the bows is always in view—small craft close to cannot get lost to view.
- (ii) The fo'ra'd bulkhead is nearly flat and the deck is planked and payed with black marine glue—both these features indicate the direction of the ship's head.

Many modern ships have inferior bridges, compared to the *Conister*—the deck slopes aft and down from the windows, and only a few feet away from the fo'ra'd bulkhead all sight of the fo'c's'le has been lost, and indeed quite often

the horizon is obscured. Again, in modern bridges with thick pile carpets and a heavily streamlined bridge front, all indication of the ship's head in the construction of the wheelhouse is lost, and the mariner has greater difficulty relating ship and sea.

Even the *Conister* is not perfect; the two pillars either side of the centre window cause the ship's shoulders to be not clearly visible to the man at the wheel so the quartermaster has difficulty when rounding a knuckle close to in a dock. Could our

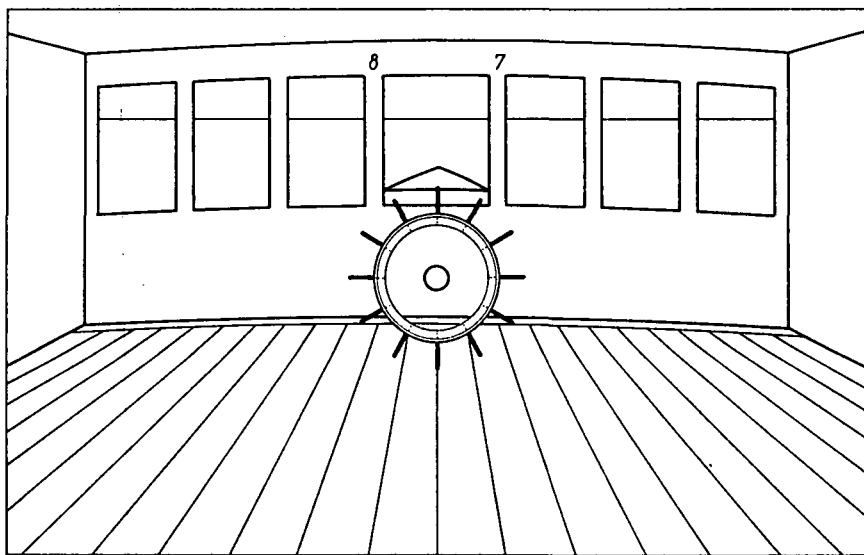


FIG. 1

brother Institute—the R.I.N.A.—be requested to consider a basic recommendation of bridge design, meeting the criteria enumerated below:

- (i) The line of sight of the O.O.W. and the Q.M. should meet the criteria illustrated in the *Conister*. Bridges which are well forward may need to be built with a reverse sheer on the deck.
- (ii) The fore end of the wheelhouse should be square or nearly square.
- (iii) The pattern on the linoleum or deck carpet should have heavily marked fore and aft lines.

This article was being prepared before I read Captain Mackay's article in the October 1974 issue of this *Journal*. I was very interested to see that his ergonomic bridge is designed to help the O.O.W. to 'bridge the gap' between the sea, the man and the ship (see i, iv, and v on page 469). I think that I have shown that, in a merchant vessel at least, this can be done by proper wheelhouse design and not by imprisoning the O.O.W. in one position. The duties of the O.O.W. on a merchant vessel differ from the duties of the O.O.W. in a warship and a fixed position would be undesirable in Merchant Service practice.